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SIEMENS

Motion Control Drives

SINAMICS Converters for Single-Axis Drives

SINAMICS G120XA infrastructure converters for standard pumps/fans

Catalog
D 31.6

Edition
January
2019

siemens.com.cn/sinamics-g120xa

Hotline: 1900.6536 - Website: HOPLONGTECH.COM

Related catalogs

Motion Control Drives	D 31.1	**Industrial Controls**	IC 10
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E86060-K5710-A111-A5-7600

Industrial Communication — IK PI
SIMATIC NET
E86060-K6710-A101-B8-7600

SIMOGEAR — MD 50.1
Geared Motors
Helical, parallel shaft, bevel, helical worm and worm geared motors
E86060-K5250-A111-A5-7600

Products for Automation and Drives — CA 01
Interactive Catalog
Download

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Motion Control System — PM 21
SIMOTION
Equipment for Production Machines
E86060-K4921-A101-A4-7600

Industry Mall
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on the Internet:

www.siemens.com/industrymall

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SINAMICS Converters
for Single-Axis Drives

**SINAMICS G120XA infrastructure converters
for standard pumps/fans**
Catalog D 31.6 · January 2019

Dear Customer,

We are happy to present you with the PDF version of the new Catalog D 31.6 · January 2019.

The catalog provides a comprehensive overview of the new SINAMICS G120XA infrastructure converter system for standard pump and fan applications. With an available power range from 0.75 kW to 560 kW, the new series masters every challenge here.

The products listed in this Catalog are also included in the Industry Mall.
Please contact your local Siemens office for additional information.

Up-to-date information about SINAMICS G120XA is available online at
www.siemens.com.cn/sinamics-g120xa

You can access our Interactive Catalog and our Industry Mall on the Internet at:
www.siemens.com/industrymall

Your personal contact will be glad to receive your suggestions and recommendations for improvement. You can find your representative in our personal contacts database at
www.siemens.com/automation-contact

We hope that you will often enjoy using Catalog D 31.6 as a selection and ordering reference document and wish you every success with our products and solutions.

With kind regards,

Achim Peltz
Vice President
General Motion Control
Siemens AG, Digital Factory, Motion Control

siemens.com.cn/sinamics-g120xa

Hotline: 1900.6536 - Website: HOPLONGTECH.COM

SINAMICS Converters for Single-Axis Drives
SINAMICS G120XA infrastructure converters for standard pumps/fans

Motion Control Drives

Catalog D 31.6 · January 2019

Refer to the Industry Mall for current updates of this catalog:
www.siemens.com/industrymall

Please contact your local Siemens branch.

System overview	**1**
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Engineering tools	**3**
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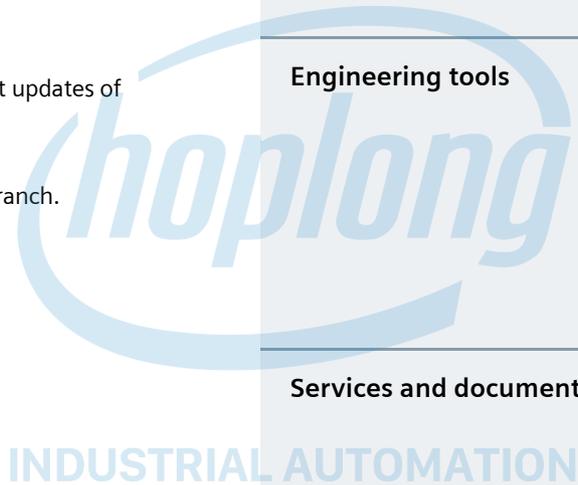
Hotline: 1900.6536 - Website: HOPLONGTECH.COM

Digital Enterprise

The building blocks that ensure everything works together perfectly in the digital enterprise

Digitalization is already changing all areas of life and existing business models. It is placing greater pressure on industry while at the same time creating new business opportunities. Today, thanks to scalable solutions from Siemens, companies can already become a digital enterprise and ensure their competitiveness.
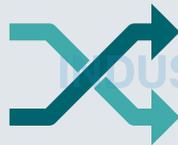
Industry faces tremendous challenges

Reduce time-to-market

Today manufacturers have to bring products to market at an ever-increasing pace despite the growing complexity of these products. In the past, a major manufacturer would push aside a small one, but now it is a fast manufacturer that overtakes a slow one.

Boost flexibility

Consumers want customized products, but at a price they would pay for a mass-produced item. That only works if production is more flexible than ever before.

Improve quality

To ensure a high level of quality while meeting legal requirements, companies have to establish closed quality loops and enable the traceability of products.

Boost efficiency

Today the product itself needs to be sustainable and environmentally friendly, while energy efficiency in production has become a competitive advantage.

Increase security

Increasing networking escalates the threat to production facilities of cyberattacks. Today more than ever, companies need suitable security measures.

The digital enterprise has already become a reality

To fully benefit from all the advantages of digitalization, companies first have to achieve complete consistency of their data. Fully digitally integrated business processes, including those of suppliers, can help to create a digital representation of the entire value chain. This requires

- the integration of industrial software and automation,

- expansion of the communication networks,

- security in automation,

- and the use of business-specific industrial services.

MindSphere
The cloud-based open IoT operating system from Siemens

With MindSphere, Siemens offers a cost-effective and scalable cloud platform as a service (PaaS) for the development of applications. The platform, designed as an open operating system for the Internet of Things, makes it possible to improve the efficiency of plants by collecting and analyzing large volumes of production data.

Totally Integrated Automation (TIA)
Where digitalization becomes reality

Totally Integrated Automation (TIA) ensures the seamless transition from the virtual to the real world. It already encompasses all the necessary conditions for transforming the benefits of digitalization into true added value. The data that will form the digital twin for actual production is generated from a common base.

Digital Plant
Learn more about the digital enterprise for the process industry
www.siemens.com/ digitalplant

Digital Enterprise Suite
Learn more about the digital enterprise for the discrete industry
www.siemens.com/ digital-enterprise-suite

Integrated Drive Systems

Faster on the market and in the black with Integrated Drive Systems

Integrated Drive Systems are Siemens' trendsetting answer to the high degree of complexity that characterizes drive and automation technology today. The world's only true one-stop solution for entire drive systems is characterized in particular by its threefold integration: Horizontal, vertical, and lifecycle integration ensure that every drive system component fits seamlessly into the whole system, into any automation environment, and even into the entire lifecycle of a plant.

The outcome is an optimal workflow – from engineering all the way to service that entails more productivity, increased efficiency, and better availability. That's how Integrated Drive Systems reduce time to market and time to profit.

Horizontal integration

Integrated drive portfolio: The core elements of a fully integrated drive portfolio are frequency converters, motors, couplings, and gear units. At Siemens, they're all available from a single source. Perfectly integrated, perfectly interacting. For all power and performance classes. As standard solutions or fully customized. No other player in the market can offer a comparable portfolio. Moreover, all Siemens drive components are perfectly matched, so they are optimally interacting.
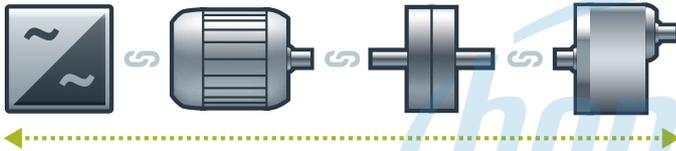
You can boost the availability of your application or plant to up to

99%*

*e.g., conveyor application

Vertical integration

Thanks to **vertical integration**, the complete drive train is seamlessly integrated in the entire automation environment – an important prerequisite for production with maximum value added. Integrated Drive Systems are part of Totally Integrated Automation (TIA), which means that they are perfectly embedded into the system architecture of the entire industrial production process. This enables optimal processes through maximum communication and control.
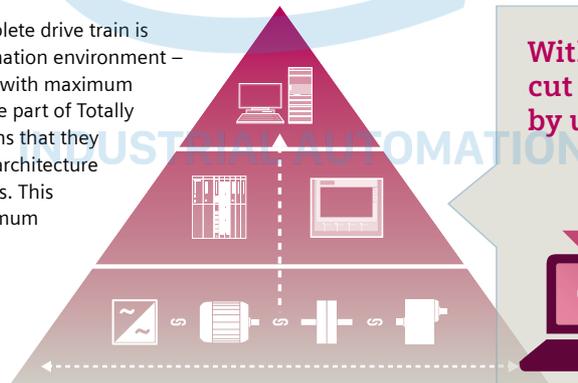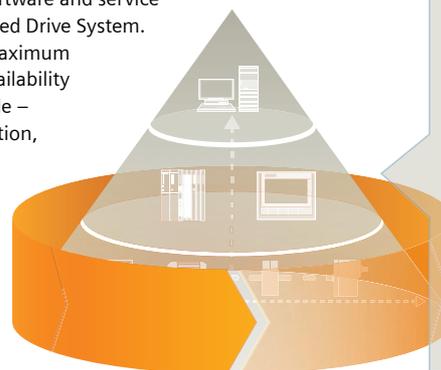
With TIA Portal you can cut your engineering time by up to

30%

Lifecycle integration

Lifecycle integration adds the factor of time: Software and service are available for the entire lifecycle of an Integrated Drive System. That way, important optimization potential for maximum productivity, increased efficiency, and highest availability can be leveraged throughout the system's lifecycle – from planning, design, and engineering to operation, maintenance, and all the way even to modernization.

With Integrated Drive Systems, assets become important success factors. They ensure shorter time to market, maximum productivity and efficiency in operation, and shorter time to profit.

With Integrated Drive Systems you can reduce your maintenance costs by up to

15%

www.siemens.com/ids

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1

Further information about SINAMICS and SIMOTICS can be found on the Internet at
www.siemens.com/sinamics
www.siemens.com/simotics

CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG

1

The SINAMICS drives family

■ Overview

Integration in automation

Management level	Office environment: SIMATIC IT / COMOS...

Process control level — Control center / control system: SIMATIC PCS 7 / WINCC

Control level — Automation systems / HMI: SIMATIC / SIMOTION / SINUMERIK

Fieldbus

SINAMICS V / SINAMICS G — pumping ventilating compressing

SINAMICS V / SINAMICS G / SINAMICS S — moving

SINAMICS V / SINAMICS G / SINAMICS S — processing

SINAMICS S — machining

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Totally Integrated Automation and communication

SINAMICS is an integral component of the Siemens "Totally Integrated Automation" concept. Integrated SINAMICS systems covering configuration, data storage, and communication at automation level ensure low-maintenance solutions with the SIMATIC, SIMOTION and SINUMERIK control systems.

Depending on the application, the appropriate variable frequency drives can be selected and incorporated in the automation concept. With this in mind, the drives are clearly subdivided into their different applications. A wide range of communication options (depending on the drive type) are available for establishing a communication link to the automation system:

- PROFINET
- PROFIBUS
- EtherNet/IP
- Modbus TCP
- Modbus RTU
- AS-Interface
- BACnet MS/TP

Applications

SINAMICS is the comprehensive family of drives from Siemens designed for machine and plant engineering applications. SINAMICS offers solutions for all drive tasks:

- Simple pump and fan applications in the process industry
- Demanding single drives in centrifuges, presses, extruders, elevators, as well as conveyor and transport systems
- Drive line-ups in textile, plastic film, and paper machines as well as in rolling mill plants
- Highly dynamic servo drives for machine tools, as well as packaging and printing machines

CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG

■ Overview (continued)

SINAMICS as part of the Siemens modular automation system

Innovative, energy-efficient and reliable drive systems and applications as well as services for the entire drive train

The solutions for drive technology place great emphasis on the highest productivity, energy efficiency and reliability for all torque ranges, performance and voltage classes.

Siemens offers not only the right innovative variable frequency drive for every drive application, but also a wide range of energy-efficient low-voltage motors, geared motors, explosion-protected motors and high-voltage motors for combination with SINAMICS.

Furthermore, Siemens supports its customers with global pre-sales and after-sales services, with over 295 service points in 130 countries – and with special services e.g. application consulting or motion control solutions.

Energy efficiency

Energy management process

Efficient energy management consultancy identifies the energy flows, determines the potential for making savings and implements them with focused activities.

Almost two thirds of the industrial power requirement is from electric motors. This makes it all the more important to use drive technology permitting energy consumption to be reduced effectively even in the configuration phase, and consequently to optimize plant availability and process stability. With SINAMICS, Siemens offers powerful energy efficient solutions which, depending on the application, enable a significant reduction in electricity costs.

CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG

1

The SINAMICS drives family

■ **Overview** (continued)

Up to 70 % potential for savings using variable-speed operation

SINAMICS enables great potential for savings to be realized by controlling the motor speed. In particular, huge potential savings can be recovered from pumps, fans and compressors which are operated with mechanical throttle and valves. Here, changing to variable-speed drives brings enormous economic advantages. In contrast to mechanical control systems, the power consumption at partial load operation is always immediately adjusted to the demand at that time. So energy is no longer wasted, permitting savings of up to 60 % – in exceptional cases even up to 70 %. Variable-speed drives also offer clear advantages over mechanical control systems when it comes to maintenance and repair. Current spikes when starting up the motor and strong torque surges become things of the past – and the same goes for pressure waves in pipelines, cavitation or vibrations which cause sustainable damage to the plant. Smooth starting and ramp-down relieve the load on the mechanical system, ensuring a significantly longer service life of the entire drive train.

Regenerative feedback of braking energy

In conventional drive systems, the energy produced during braking is converted to heat using braking resistors. Energy produced during braking is efficiently recovered to the supply system by versions of SINAMICS G and SINAMICS S drives with regenerative feedback capability and these devices do not therefore need a braking resistor. This permits up to 60 % of the energy requirement to be saved, e.g. in lifting applications. Energy which can be reused at other locations on a machine. Furthermore, this reduced power loss simplifies the cooling of the system, enabling a more compact design.
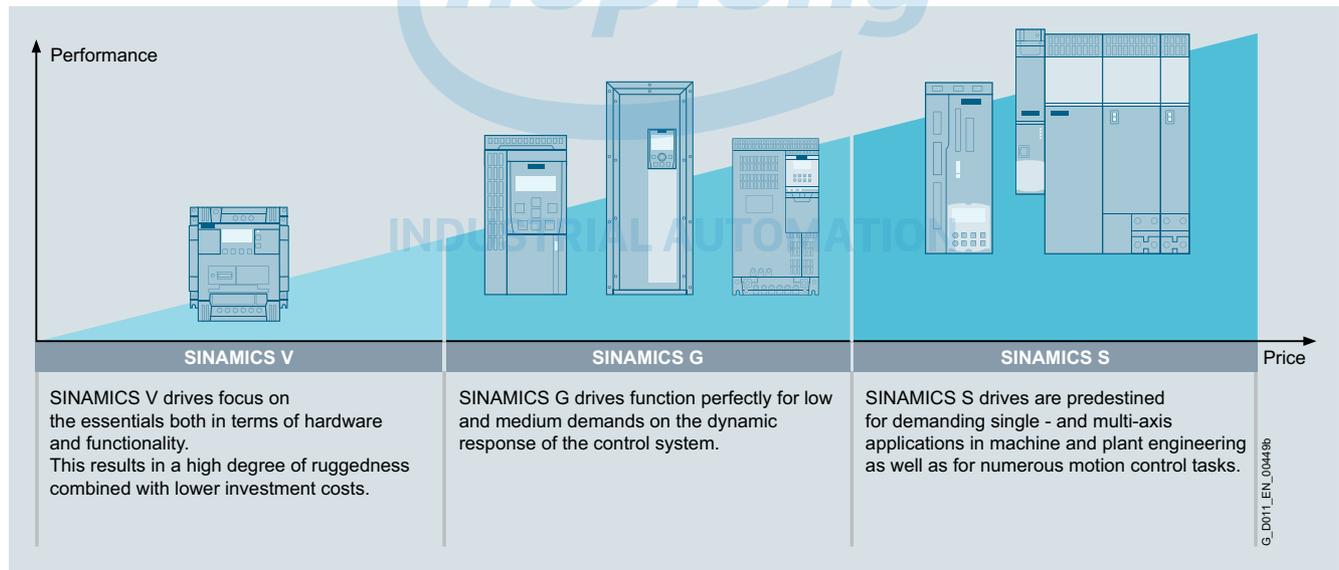
Energy transparency in all configuration phases

Early on, in the configuration phase, the SIZER for Siemens Drives engineering tool provides information on the specific energy requirement. The energy consumption across the entire drive train is visualized and compared with different plant concepts.

SINAMICS in combination with energy-saving motors

Engineering integration stretches beyond the SINAMICS drive family to higher-level automation systems, and to a broad spectrum of energy-efficient motors with a wide range of performance classes, which, compared to previous motors, are able to demonstrate up to 10 % greater efficiency.

Variants

Depending on the application, the SINAMICS range offers the ideal variant for any drive task.

SINAMICS V	SINAMICS G	SINAMICS S
SINAMICS V drives focus on the essentials both in terms of hardware and functionality. This results in a high degree of ruggedness combined with lower investment costs.	SINAMICS G drives function perfectly for low and medium demands on the dynamic response of the control system.	SINAMICS S drives are predestined for demanding single - and multi-axis applications in machine and plant engineering as well as for numerous motion control tasks.

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Overview (continued)

Platform concept

All SINAMICS variants are based on a platform concept. Joint hardware and software components, as well as standardized tools for dimensioning, configuration, and commissioning tasks ensure high-level integration across all components. SINAMICS handles a wide variety of drive tasks with no system gaps. The different SINAMICS variants can be easily combined with each other.

Quality management according to EN ISO 9001

SINAMICS conforms to the most exacting quality requirements. Comprehensive quality assurance measures in all development and production processes ensure a consistently high level of quality.

Of course, our quality management system is certified by an independent authority in accordance with EN ISO 9001.

IDS – Integration at its very best

The Siemens Integrated Drive Systems (IDS) solution offers perfectly matched drive components with which you can meet your requirements. The drive components reveal their true strengths as an Integrated Drive System over the full range from engineering and commissioning through to operation: Integrated system configuration is performed using the Drive Technology Configurator: Just select a motor and an converter and design them with the SIZER for Siemens Drives engineering tool. The STARTER and SINAMICS Startdrive commissioning tools integrate the motor data and at the same time simplify efficient commissioning. Integrated Drive Systems are incorporated in the TIA Portal – this simplifies engineering, commissioning and diagnostics.

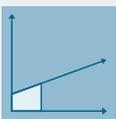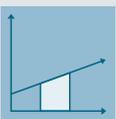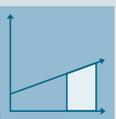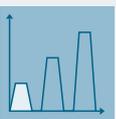| Low voltage										DC voltage	Medium voltage
Basic performance		General performance						High performance		DC applications	Applications with high outputs
SINAMICS V20	SINAMICS V90	SINAMICS G120C G120 G120X G120XA	SINAMICS G110D G120D G110M SIMATIC ET 200pro FC-2	SINAMICS G130 G150	SINAMICS G180	SINAMICS S110	SINAMICS S210	SINAMICS S120 S120M	SINAMICS S150	SINAMICS DCM	SINAMICS GH150 GH180 GM150 SM150 GL150 SL150 SM120CM
0.12 kW to 30 kW	0.05 kW to 7 kW	0.37 kW to 630 kW	0.37 kW to 7.5 kW	75 kW to 2700 kW	2.2 kW to 6600 kW	0.55 kW to 132 kW	0.05 kW to 7 kW	0.55 kW to 5700 kW	75 kW to 1200 kW	6 kW to 30 MW	0.15 MW to 85 MW
Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines, refrigerated display counters, fitness equipment, ventilation systems	Handling machines, packaging machines, automatic assembly machines, metal forming machines, printing machines, winding and unwinding units	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders, building management systems, process industry, HVAC, single-axis positioning applications in machine and plant engineering	Conveyor technology, single-axis positioning applications (G120D)	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Sector-specific for pumps, fans, compressors, conveyor belts, extruders, mixers, mills, kneaders, centrifuges, separators	Single-axis positioning applications in machine and plant engineering	Packaging machines, handling equipment, feed and withdrawal devices, stacking units, automatic assembly machines, laboratory automation, wood, glass and ceramics industry, digital printing machines	Production machines (packaging, textile and printing machines, paper machines, plastic processing machines), machine tools, plants, process lines and rolling mills, marine drives, test bays	Test bays, cross cutters, centrifuges	Rolling mill drives, wire-drawing machines, extruders and kneaders, cableways and lifts, test bay drives	Pumps, fans, compressors, mixers, extruders, mills, crushers, rolling mills, conveyor technology, excavators, test bays, marine drives, blast furnace fans, retrofit
Catalog D 31.1	Catalog D 33	Catalogs D 31.1, D 31.5, D 31.6	Catalog D 31.2	Catalog D 11	Catalog D 18.1	Catalog D 31.1	Catalog D 32	Catalogs D 21.3, D 21.4 NC 62	Catalog D 21.3	Catalog D 23.1	Catalogs D 15.1, D 12
Engineering tools (e.g. Drive Technology Configurator, SIZER for Siemens Drives, STARTER and SINAMICS Startdrive)											

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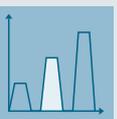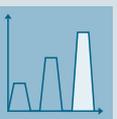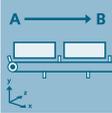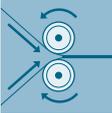**CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG**

System overview

1

Drive selection

Overview

SINAMICS selection guide – typical applications

Use	Requirements for torque accuracy/speed accuracy/position accuracy/coordination of axes/functionality					
	Continuous motion			**Non-continuous motion**		
	Basic	Medium	High	Basic	Medium	High
Pumping, ventilating, compressing	Centrifugal pumps Radial / axial fans Compressors	Centrifugal pumps Radial / axial fans Compressors	Eccentric screw pumps	Hydraulic pumps Metering pumps	Hydraulic pumps Metering pumps	Descaling pumps Hydraulic pumps
	V20 G120C **G120X, G120XA**	**G120X, G120XA** G130/G150 G180 [1]	S120	G120	S110	S120
Moving	Conveyor belts Roller conveyors Chain conveyors	Conveyor belts Roller conveyors Chain conveyors Lifting/ lowering devices Elevators Escalators/ moving walkways Indoor cranes Marine drives Cable railways	Elevators Container cranes Mining hoists Excavators for open-cast mining Test bays	Acceleration conveyors Storage and retrieval machines	Acceleration conveyors Storage and retrieval machines Cross cutters Reel changers	Storage and retrieval machines Robotics Pick & place Rotary indexing tables Cross cutters Roll feeds Engagers/ disengagers
	V20 G110D G110M G120C ET 200pro FC-2 [2]	G120 G120D G130/G150 G180 [1]	S120 S150 DCM	V90 G120 G120D	S110 S210 DCM	S120 S210 DCM
Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	Extruders Winders/unwinders Lead/follower drives Calenders Main press drives Printing machines	Tubular bagging machines Single-axis motion control such as • Position profiles • Path profiles	Tubular bagging machines Single-axis motion control such as • Position profiles • Path profiles	Servo presses Rolling mill drives Multi-axis motion control such as • Multi-axis positioning • Cams • Interpolations
	V20 G120C	G120 G130/G150 G180 [1]	S120 S150 DCM	V90 G120	S110 S210	S120 S210 DCM
Machining	Main drives for • Turning • Milling • Drilling	Main drives for • Drilling • Sawing	Main drives for • Turning • Milling • Drilling • Gear cutting • Grinding	Axis drives for • Turning • Milling • Drilling	Axis drives for • Drilling • Sawing	Axis drives for • Turning • Milling • Drilling • Lasering • Gear cutting • Grinding • Nibbling and punching
	S110	S110 S120	S120	S110	S110 S120	S120

Using the SINAMICS selection guide

The varying range of demands on modern variable frequency drives requires a large number of different types. Selecting the optimum drive has become a significantly more complex process. The application matrix shown simplifies this selection process considerably, by suggesting the ideal SINAMICS drive for examples of typical applications and requirements.

• The application type is selected from the vertical column
  - Pumping, ventilating, compressing
  - Moving
  - Processing
  - Machining
• The quality of the motion type is selected from the horizontal row
  - Basic
  - Medium
  - High

More information

Further information about SINAMICS is available on the Internet at
www.siemens.com/sinamics

Practical application examples and descriptions are available on the Internet at
www.siemens.com/sinamics-applications

[1] Industry-specific converters.

[2] Information on the SIMATIC ET 200pro FC-2 frequency converter is available in Catalog D 31.2 and at www.siemens.com/et200pro-fc

Hotline: 1900.6536 – Website: HOPLONGTECH.COM

Overview

SIMOTICS						
Low-voltage motors for line and converter operation						
General Purpose SIMOTICS GP	Severe Duty SIMOTICS SD	Explosion-proof SIMOTICS XP	Definite Purpose SIMOTICS DP	Flexible Duty SIMOTICS FD	Non standard SIMOTICS TN	High Torque SIMOTICS HT
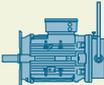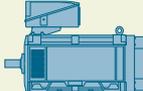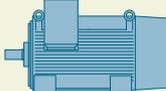
DC motors — Direct current SIMOTICS DC

High-voltage motors — High Voltage SIMOTICS HV

Motors for motion control

SIMOTICS S servomotors	SIMOTICS M main motors	SIMOTICS L linear motors	SIMOTICS T torque motors
Servomotors / Servo geared motors			

SIMOTICS stands for

- 150 years of experience in building electric motors
- The most comprehensive range of motors worldwide
- Optimum solutions in all industries, regions and power/performance classes
- Innovative motor technologies of the highest quality and reliability
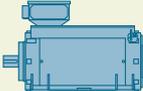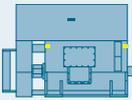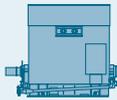- Highest dynamic performance, precision and efficiency together with the optimum degree of compactness
- Our motors can be integrated into the drive train as part of the overall system
- A global network of skill sets and worldwide service around the clock

A clearly structured portfolio

The entire SIMOTICS product portfolio is transparently organized according to application-specific criteria in order to help users select the optimum motor for their application.

The product range extends from standard motors for pumps, fans and compressors to highly dynamic, precise motion control motors for positioning tasks and motion control in handling applications, as well as production machinery and machine tools, to DC motors and powerful high-voltage motors. Whatever it is that you want to move – we can supply the right motor for the task.

www.siemens.com/simotics

An outstanding performance for any job

A key characteristic of all SIMOTICS motors is their quality. They are robust, reliable, dynamic and precise to assure the requisite performance level for any process and deliver exactly the capabilities demanded by the application in hand. Thanks to their compact design, they can be integrated as space-saving units into installations. Furthermore, their impressive energy efficiency makes them effective as a means of reducing operating costs and protecting the environment.

A dense network of skill sets and servicing expertise around the world

SIMOTICS offers not only a wealth of sound experience gleaned from a development history which stretches back over around 150 years, but also the know-how of hundreds of engineers. This knowledge and our worldwide presence form the basis for a unique proximity to industries which feeds through in tangible terms to the specific motor configuration which is tailored to suit your application.

Our specialists are available to answer all your queries regarding any aspect of motor technology. At any time – wherever you are in the world. When you choose SIMOTICS, therefore, you reap the benefits of a global service network which is continuously accessible, thereby helping to optimize response times and minimize downtimes.

Perfection of the complete drive train

SIMOTICS is perfectly coordinated with other Siemens product families. In combination with the SINAMICS integrated drives family and the SIRIUS complete portfolio of industrial controls, SIMOTICS fits seamlessly as part of the complete drive train into automation solutions which are based on the SIMATIC, SIMOTION and SINUMERIK control systems.

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System overview

1

SIMOTICS low-voltage motors for line and converter operation

■ **Overview**

Low-voltage motors for mains and converter operation						
General Purpose SIMOTICS GP	Severe Duty SIMOTICS SD	Explosion Proof SIMOTICS XP	Definite Purpose SIMOTICS DP	Transnorm SIMOTICS TN	Flexible Duty SIMOTICS FD	High Torque SIMOTICS HT
IEC: 0.09 … 45 kW Reluctance: 0.55 … 48 kW NEMA: 1 … 20 hp	IEC: 0.09 … 315 kW Reluctance: 0.55 … 48 kW NEMA: 1 … 400 hp	IEC: 0.09 … 1 000 kW NEMA: 1 … 300 hp	IEC: 0.09 … 481 kW NEMA: 1 … 250 hp	200 … 3 500 kW	200 … 1 800 kW	150 … 2 100 kW
IEC: 0.61 … 293.8 Nm Reluctance: 3.5 … 191 Nm NEMA: 1.5 … 60 lb-ft	IEC: 1.3 … 2 070 Nm Reluctance: 3.5 … 191 Nm NEMA: 1.5 … 1 483 lb-ft	IEC: 0.61 … 8 090 Nm NEMA: 1.5 … 1 187 lb-ft	IEC: 2.5 … 3 142 Nm NEMA: 1.5 … 1 104 lb-ft	800 … 22 500 Nm	610 … 14 600 Nm	6 000 … 42 000 Nm
IEC: 750 … 3 000 rpm (at 50 Hz) Reluctance: 1 500/1 800/2 610 rpm NEMA: 900 … 3 600 rpm (at 60 Hz)	IEC: 750 … 3 000 rpm (at 50 Hz) Reluctance: 1500/1800/2610 /3000/3600 rpm NEMA: 900 … 3 600 rpm (at 60 Hz)	IEC: 750 … 3 000 rpm (at 50 Hz) NEMA: 900 … 3 600 rpm (at 60 Hz)	IEC: 750 … 3 000 rpm (at 50 Hz) NEMA: 900 … 3 600 rpm (at 60 Hz)	IEC: 750 … 3 000 rpm (at 50 Hz)	IEC: 750 … 3 000 rpm (at 50 Hz)	IEC: 200 … 800 rpm (at 50 Hz)
Pumps, fans and compressors with especially low weight require-ments	Pumps, fans, compressors, mixers, mills, extruders and rollers with special demands in terms of ruggedness, particularly in the chemical and petrochemical industries	General industrial applications with special require-ments regarding explosion protection for use in Zones 1, 2, 21, and 22 such as in the process industry	Ships, work and transport roller tables, tunnels, multi-story car parks, shopping malls, dockside cranes, container terminals as well as motors customized for special applications	Pumps, fans, compressors, conveyor belts, mixers, extruders in the chem. and petrochem. industry, paper-making machines, mining, cement, steel industry, and marine applications including propulsion	Pumps, fans, compressors, conveyor belts, centrifuges, extruders, winders, hoisting gear in cranes, presses, paper machines, rolling mills, marine applications including propulsion	High-torque gearless motors for paper-making machines, low-speed pumps, mills, steel shears, bow thrusters, winches or main drives on ships
IEC: D 81.1 NEMA: D 81.2	IEC: D 81.1 NEMA: D 81.2	IEC: D 81.1, D 83.1 NEMA: D 81.2	IEC: D 81.1 NEMA: D 81.2	D 81.1, D 84.1	D 81.8	D 86.2

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SIMOTICS GP and SIMOTICS SD

SIMOTICS GP General Purpose motors with an aluminum housing are suitable for a wide range of standard drive tasks in industrial environments. SIMOTICS SD Severe Duty motors with a cast-iron housing are extremely rugged and are therefore the first choice for applications in harsh environmental conditions.

SIMOTICS GP and SIMOTICS SD are fundamentally optimized for line operation. In addition, two converter-optimized motor lines are available for variable-speed converter-fed operation.

• **Induction technology (VSD10 line)**
The VSD10 line converter motors are designed exclusively for use on converters and are specially optimized for SINAMICS frequency converters. In terms of economy, efficiency and reliability, they are perfectly matched to SINAMICS G120 standard converters over the complete life cycle.

• **Synchronous reluctance technology (VSD4000 line)**
VSD4000 line reluctance motors are designed exclusively for use on converters and are specially optimized for SINAMICS G120. Compared to systems with induction motors, synchronous reluctance technology is characterized by particularly high efficiency levels, especially in the partial load range, and by high dynamics. The vector control of the frequency converter ensures optimal operating characteristics. More information on the reluctance drive system is available at
www.siemens.com/reluctance-drive-system

Overview

Step by step to more efficiency

One of the core objectives of the European Union is a sustainable power industry. In industrial plants today, around 70 % of the power demand is from electrically driven systems. This high percentage contains huge potential for saving energy in electrical drives. For that reason, the European Union introduced minimum requirements for the energy efficiency of electric motors in the form of a statutory motor regulation as early as 2011.

However, measures aimed solely at the motor are not enough to achieve the mandatory energy-saving targets. The European legislation fills this gap with the standard series EN 50598 and extends the focus from individual drive components to entire drive systems, even enabling consideration of specific use cases.

The European standard series EN 50598 defines the ecodesign requirements for drive systems in the low-voltage range with an electrically driven machine. It consists of definitions for energy efficiency (parts 1 and 2) and an ecobalance calculation (part 3).
To take account of the different use cases, consideration of eight application-relevant operating points has been introduced as mandatory for the first time. Determination of loss values at these eight points and definition of efficiency classes are laid down by the standard in a uniform way. This enables data relevant to operation, such as application-specific load profiles, to now be taken into account more easily in the energy efficiency analysis.

The standard is especially important for variable-speed drives of the following types:

- for AC/AC converters without energy recovery functionality
- for motors with integrated converters
- for supply voltages of 100 V to 1000 V
- for power ratings of 0.12 kW to 1000 kW

To cover all applications of driven machines, the new standard defines operating points in full-load and partial-load operation, at which the losses of the motor and drive systems have to be determined. Based on the loss data at the operating points in partial-load operation, variable-speed drives can be explicitly considered in more detail. This makes their advantages especially clear.
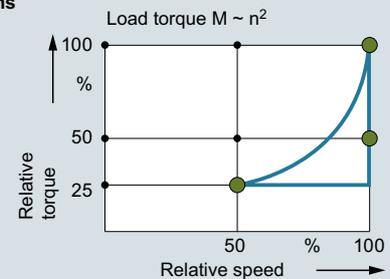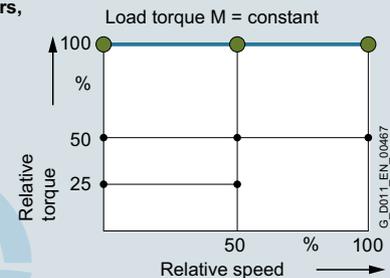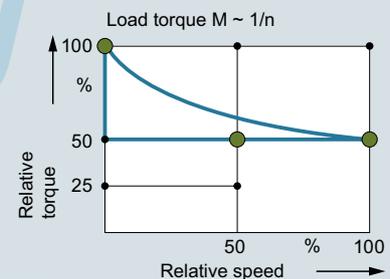
Duty cycles for different driven machines

Moreover, frequency converters and motor systems are classified in efficiency classes, which permit an initial rough estimate of the potential saving. Definition of reference systems is a key aspect of this because they provide standard reference values. The positioning of these reference systems defines the efficiency class. The relative distance from the reference system can be used as an absolute measure of the efficiency at the operating point in question.

■ **Overview** (continued)

Advantages of the detailed loss consideration of EN 50598 over the previous consideration of efficiencies and maximum loss values

For motors, the efficiency consideration was previously only defined for operation without a converter at 50/60 Hz. It provides a good way of comparing the energy efficiency of motors from different manufacturers for this use case.

The more detailed loss analysis of EN 50598, on the other hand, is aimed at speed-controlled operation and therefore now also includes motors especially designed for converter operation in the energy analysis. These were previously not covered by the applicable standards.
Moreover, a loss analysis over the entire setting and load range of the motor is possible. This is done in accordance with the standard EN 50598 with typical values.

For holistic consideration, it is essential to include all the relevant components of a drive system. The EN 50598 standard defines this in detail. The standardized expression of power loss data as a percentage makes comparison considerably easier and more transparent.

The method also makes it possible to consider a motor that produces a holding torque at speed zero, for example. In this case, the efficiency is zero, but a power loss from current producing magnetization and holding torque does occur. In summary, the key advantage of standard EN 50598 is the ability to perform the energy analysis of an electrical drive system based on standardized load profiles in all operating ranges due to uniform general conditions. This provides the user with complete transparency irrespective of the manufacturer.

Establishing efficiency classes of frequency converters (Complete Drive Modules CDM)

To avoid overmodulation and to ensure comparability between makes, which cannot be achieved otherwise, the efficiency classes of CDMs refer to the 90/100 operating point (90 % motor stator frequency, 100 % torque current).

Standard EN 50598-2 defines the relative losses of a CDM in efficiency classes IE0 to IE2. With reference to the value of a CDM of efficiency class IE1 (reference converter), a CDM of efficiency class IE2 has 25 % lower losses and a CDM of efficiency class IE0 has 25 % higher losses.

Operating points for CDMs
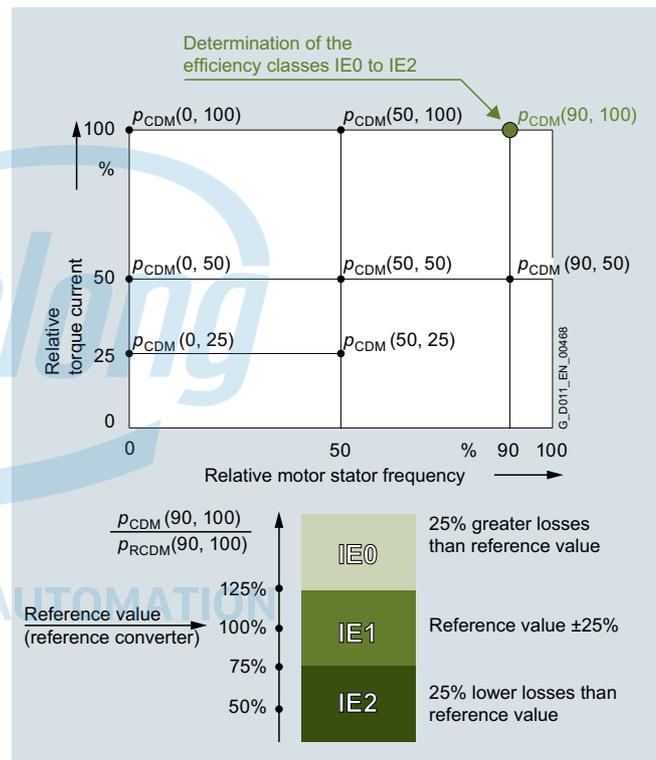
Complete Drive Module (CDM) – determining the efficiency class

Establishing the efficiency classes of drive systems (Power Drive Systems PDS)

What is possible for the individual systems, of course, also applies to the entire electrical PDS (frequency converter plus motor). Detailed comparisons are now possible at this level, too. The reference values for the reference system provide clear indications of the energy performance of the PDS.

Because targeted matching of the motor and CDM provides additional potential for optimization in electrical drive systems, it is especially important for the user to consider the entire drive system.

For the efficiency class of a PDS, too, a specific load point is defined. In this case, the reference point used is the 100/100 operating point (100 % motor stator frequency, 100 % torque).

Standard EN 50598-2 defines the relative losses of a PDS in efficiency classes IES0 to IES2. With reference to the value of a PDS of efficiency class IES1 (reference drive), a PDS of efficiency class IES2 has 20 % lower losses and a PDS of efficiency class IES0 has 20 % higher losses.

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System overview

Overview (continued)

Operating points for PDS

Motor losses

p_{RM} (100, 100)

Relative torque current — axis: 100 %, 50, 25, 0
Relative speed — axis: 0, 50, % 100

CDM losses
(Complete Drive Modules, frequency converters)

p_{CDM} (0, 100) p_{CDM} (50, 100) p_{CDM} (90, 100)
p_{CDM} (0, 50) p_{CDM} (50, 50) p_{CDM} (90, 50)
p_{CDM} (0, 25) p_{CDM} (50, 25)

Relative torque current — axis: 100 %, 50, 25, 0
Relative motor stator frequency — axis: 0, 50, % 90 100

PDS losses
(Power Drive System)

Determination of the
efficiency classes IES0 to IES2

p_{PDS} (0, 100) p_{PDS} (50, 100) p_{PDS} (100, 100)
p_{PDS} (0, 50) p_{PDS} (50, 50) p_{PDS} (100, 50)
p_{PDS} (0, 25) p_{PDS} (50, 25)

Relative torque — axis: 100 %, 50, 25, 0
Relative speed — axis: 0, 50, % 90 100

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$$\frac{p_{PDS}\,(100,\,100)}{p_{RPDS}\,(100,\,100)}$$

120%	IES0	20% greater losses than reference value
100%	IES1	Reference value ±20%
80%		
50%	IES2	20% lower losses than reference value

Reference value
(reference system =
reference converter
+ reference motor)

Power Drive System (PDS) – determining the efficiency class

More information

An example of a highly efficient drive system with efficiency class IES2 is the new synchronous inductance drive system with SIMOTICS reluctance motors and SINAMICS drives. More information is available on the Internet at
www.siemens.com/drivesystem-reluctance
www.siemens.com/simotics-gp
www.siemens.com/simotics-sd

Power loss data of SINAMICS converters for single-axis drives are available on the Internet at
https://support.industry.siemens.com/cs/document/94059311

More information on current laws and standards, new standards, and mandatory guidelines is available on the Internet at
www.siemens.com/legislation-and-standards

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System overview

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SINAMICS G120XA Starter Kit

■ Overview

IOP-2
(Intelligent Operator Panel)

SINAMICS G120XA
FSA with BOP-2
(Basic Operator Panel)

SINAMICS G120
Smart Access
(web server module)

SINAMICS G120XA Starter Kit

The SINAMICS G120XA Starter Kit comprises a SINAMICS G120XA converter (380 ... 440 V 3 AC, USS, Modbus RTU, BACnet MS/TP, FSA, 0.75 kW) with a BOP-2 Basic Operator Panel, an IOP-2 Intelligent Operator Panel and a web server module SINAMICS G120 Smart Access.

The delivery quantity is limited to three per customer.

The SINAMICS G120XA Starter Kits can be perfectly combined with the SIMATIC Starter Kits. In this way simple drive tasks up to motion control applications can be quickly implemented.

Further information on SIMATIC Starter Kits can be found at:
www.siemens.com/s7-1200-starterkits
www.siemens.com/s7-1500-starterkits

■ Selection and ordering data

Description	Article No.
SINAMICS G120XA Starter Kit (available soon)	**6SL3200-0AE71-0AA0**
• 380 ... 440 V 3 AC converter, USS, Modbus RTU, BACnet MS/TP, FSA, 0.75 kW	
• BOP-2	
• IOP-2	
• SINAMICS G120 Smart Access	

SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

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Further information about SINAMICS G120XA
can be found on the Internet at
www.siemens.com.cn/sinamics-g120xa

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SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

SINAMICS G120XA infrastructure converters for standard pumps/fans

■ **Integration**

Block diagram SINAMICS G120XA

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SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

Integration (continued)

Control Unit interfaces
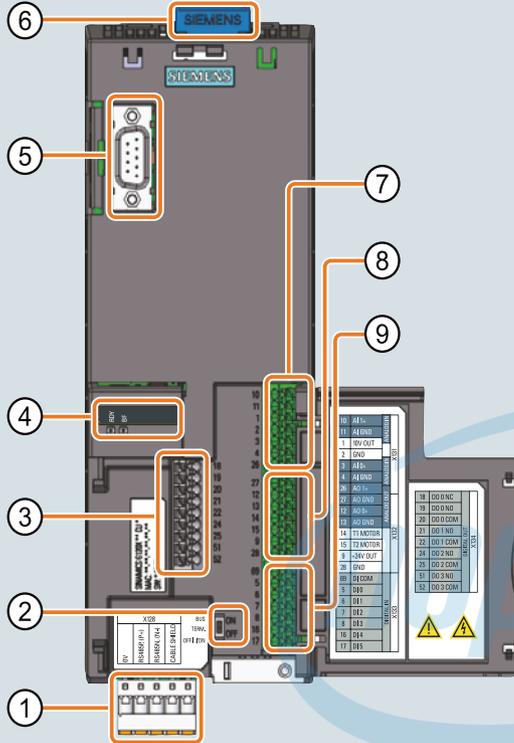
1	USS, Modbus RTU, BACnet MS/TP interfaces
2	Bus termination switch
3	Terminal strip X134
4	Status LEDs
5	Interface X21 to operator panel or SINAMICS G120 Smart Access
6	Memory card slot
7	Terminal strip X131
8	Terminal strip X132
9	Terminal strip X133

USS, Modbus RTU, BACnet MS/TP interfaces

RS485P (P+)
RS485N (N-)
0V
Cable Shield
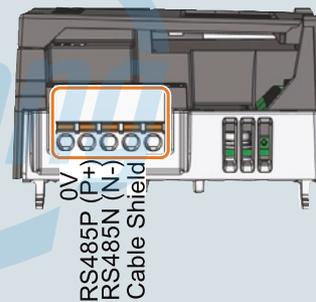
Terminals (factory settings)

-X131
10	AI 1+	Analog input (-10 V ... 10 V, 0/4 mA ... 20 mA)
11	AI GND	Reference for terminal 10
1	+10V out	10 V output (max. 10 mA)
2	GND	Reference for terminals 1, 9, 12 and 26
3	AI 0+	Analog input (-10 V ... 10 V, 0/4 mA ... 20 mA)
4	AI GND	Reference for terminal 3
26	AO 1+	Analog output (-10 V … 10 V, 0/4 mA … 20 mA)

-X132
27	GND	Reference for terminals 1, 9, 12 and 26
12	AO 0+	Analog output (-10 V … 10 V, 0/4 mA … 20 mA)
13	GND	Reference for terminals 1, 9, 12 and 26
14	T1 MOTOR	Temperature sensor (PTC, KTY84, Pt1000, bimetal)
15	T2 MOTOR	
9	+24V out	24 V output, max. 250 mA
28	GND	Reference for terminals 1, 9, 12 and 26

-X134
18	DO 0 NC
19	DO 0 NO
20	DO 0 COM
21	DO 1 NO
22	DO 1 COM
24	DO 2 NO
25	DO 2 COM
51	DO 3 NO
52	DO 3 COM

Digital outputs, max. 1 A 30 V DC / 1 A 250V AC

-X133
69	DI COM	Reference for digital inputs
5	DI 0	Digital inputs Connection, contacts switching to p or m potential low < 5 V, high > 11 V, max. 30 V
6	DI 1	
7	DI 2	
8	DI 3	
16	DI 4	
17	DI 5	

≥ 4.7 kΩ
+10 V ext
GND ext

Connection example for SINAMICS G120XA
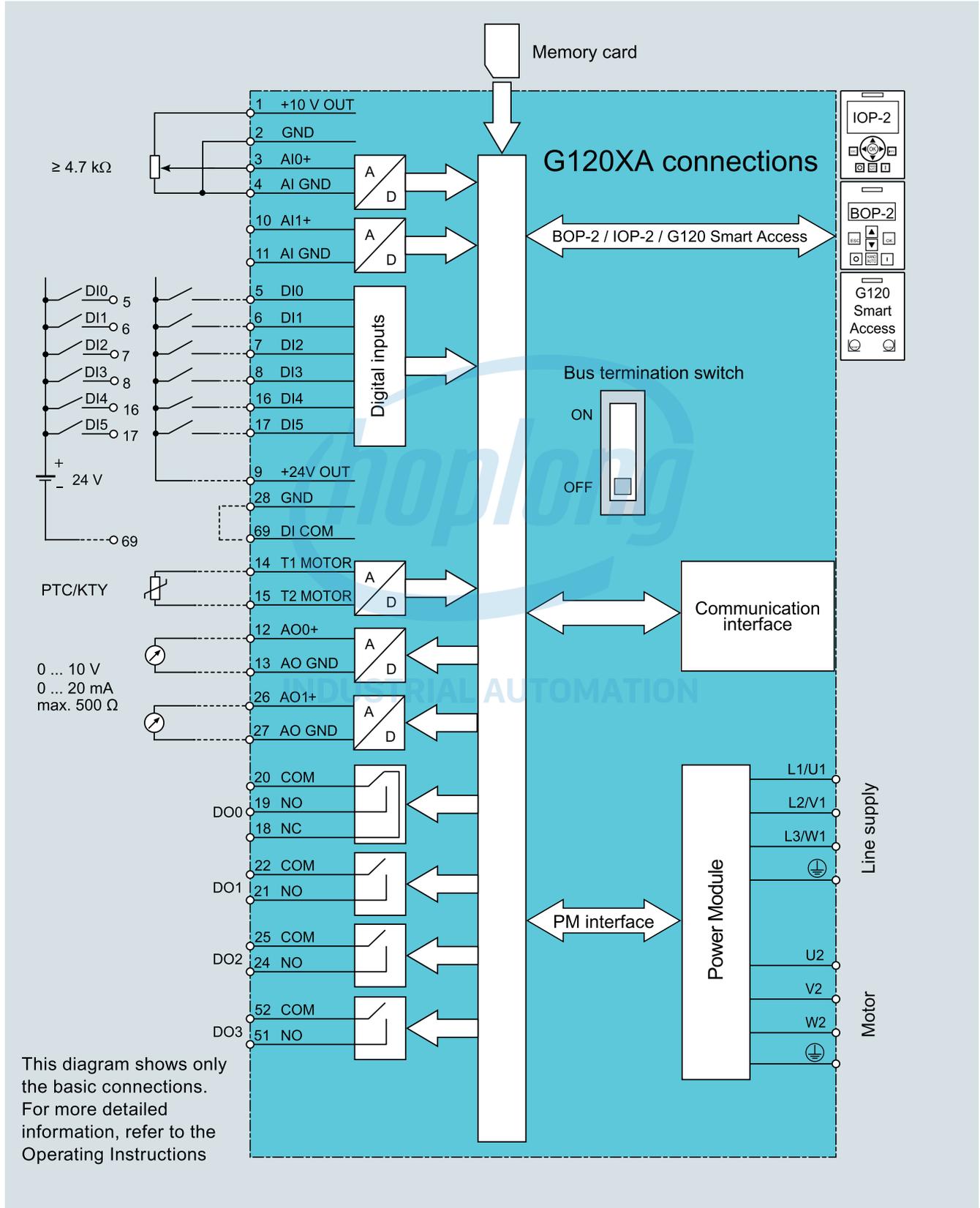
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SINAMICS G120XA infrastructure converters for standard pumps/fans

0.75 kW to 560 kW

**SINAMICS G120XA infrastructure converters for standard pumps/fans**

■ **Selection and ordering data**

SINAMICS G120XA converters · Degree of protection IP20, IP00 for frame size FSJ ➡ Configuration with line- and load-side components (see right page)

Rated power [1]	Rated output current I_{rated} [2]	Rated input current [3]	Frame size	SINAMICS G120XA Degree of protection IP20, IP00 for frame size FSJ **without integrated line filter** Converters up to 132 kW delivery ex stock		SINAMICS G120XA Degree of protection IP20, IP00 for frame size FSJ **with integrated line filter** Converters up to 15 kW delivery ex stock	
400 V	400 V	400 V			10 ... 48		10 ... 28
kW	**A**	**A**		Article No.	⇓⇓	Article No.	⇓⇓
380 ... 440 V 3 AC · Rated pulse frequency 4 kHz ≤ 90 kW and 2 kHz ≥ 110 kW · Input frequency 47 ... 63 Hz							
0.75	2.2	2.1	FSA	6SL32 2 0-■ YD10- 0 U B 0		6SL32 2 0-■ YD10- 0 C B 0	
1.1	3.1	2.8	FSA	6SL32 2 0-■ YD12- 0 U B 0		6SL32 2 0-■ YD12- 0 C B 0	
1.5	4.1	3.6	FSA	6SL32 2 0-■ YD14- 0 U B 0		6SL32 2 0-■ YD14- 0 C B 0	
2.2	5.6	5.3	FSA	6SL32 2 0-■ YD16- 0 U B 0		6SL32 2 0-■ YD16- 0 C B 0	
3	7.3	6.6	FSA	6SL32 2 0-■ YD18- 0 U B 0		6SL32 2 0-■ YD18- 0 C B 0	
4	8.8	8.5	FSB	6SL32 2 0-■ YD20- 0 U B 0		6SL32 2 0-■ YD20- 0 C B 0	
5.5	12.5	11.5	FSB	6SL32 2 0-■ YD22- 0 U B 0		6SL32 2 0-■ YD22- 0 C B 0	
7.5	16.5	15.8	FSB	6SL32 2 0-■ YD24- 0 U B 0		6SL32 2 0-■ YD24- 0 C B 0	
11	25	25.8	FSC	6SL32 2 0-■ YD26- 0 U B 0		6SL32 2 0-■ YD26- 0 C B 0	
15	31	28.5	FSC	6SL32 2 0-■ YD28- 0 U B 0		6SL32 2 0-■ YD28- 0 C B 0	
18.5	37	41	FSD	6SL32 2 0-■ YD30- 0 U B 0		6SL32 2 0-■ YD30- 0 C B 0	
22	43	46	FSD	6SL32 2 0-■ YD32- 0 U B 0		6SL32 2 0-■ YD32- 0 C B 0	
30	58	56	FSD	6SL32 2 0-■ YD34- 0 U B 0		6SL32 2 0-■ YD34- 0 C B 0	
37	68	73	FSD	6SL32 2 0-■ YD36- 0 U B 0		6SL32 2 0-■ YD36- 0 C B 0	
45	82.5	84	FSD	6SL32 2 0-■ YD38- 0 U B 0		6SL32 2 0-■ YD38- 0 C B 0	
55	103	106	FSE	6SL32 2 0-■ YD40- 0 U B 0		6SL32 2 0-■ YD40- 0 C B 0	
75	136	143	FSF	6SL32 2 0-■ YD42- 0 U B 0		6SL32 2 0-■ YD42- 0 C B 0	
90	164	164	FSF	6SL32 2 0-■ YD44- 0 U B 0		6SL32 2 0-■ YD44- 0 C B 0	
110	201	200	FSF	6SL32 2 0-■ YD46- 0 U B 0		6SL32 2 0-■ YD46- 0 C B 0	
132	237	234	FSF	6SL32 2 0-■ YD48- 0 U B 0		6SL32 2 0-■ YD48- 0 C B 0	
160	289	278	FSG	–		6SL32 2 0-■ YD50- 0 C B 0	
200	364	348	FSG	–		6SL32 2 0-■ YD52- 0 C B 0	
250	436	417	FSG	–		6SL32 2 0-■ YD54- 0 C B 0	
315	590	617	FSH	–		6SL32 2 0-■ YD56- 0 C B 0	
355	645	684	FSH	–		6SL32 2 0-■ YD58- 0 C B 0	
400	725	760	FSH	–		6SL32 2 0-■ YD60- 0 C B 0	
450	820	870	FSJ	–		6SL32 2 5-■ YD62- 0 C B 0	
500	895	959	FSJ	–		6SL32 2 5-■ YD64- 0 C B 0	
560	1015	1060	FSJ	–		6SL32 2 5-■ YD66- 0 C B 0	

Article No. supplements

Environmental class/harmful chemical substances acc. to EN 60721-3-3		
Class 3C2 – **delivery ex stock**	2	2
Operator Panel		
Without Operator Panel *	1	1
With BOP-2 Basic Operator Panel (numeric 2-line display) – **delivery ex stock**	2	2
With IOP-2 Intelligent Operator Panel (graphic color display) *	3	3
Line filter		
Without integrated line filter – **delivery ex stock**	U	
With integrated line filter Category C3 – **delivery ex stock**		C
Communication		
USS, Modbus RTU, BACnet MS/TP – **delivery ex stock**	B	B

* If you select one of these supplements, the delivery time for converters without integrated line filter up to 132 kW or with integrated line filter up to 15 kW will change from "**delivery ex stock**" to "**standard delivery time**".

[1] Rated power based on the rated output current I_{rated}. The rated output current I_{rated} is based on the duty cycle for low overload (LO).

[2] The rated output current I_{rated} is based on the duty cycle for low overload (LO). These current values are valid for 400 V and are specified on the rating plate of the converter.

[3] The input current depends on the motor load and line impedance. The input currents apply for a load at rated power (based on I_{rated}) for a line impedance corresponding to $u_K = 1$ %. The current values are specified on the rating plate of the converter.

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SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

SINAMICS G120XA infrastructure converters for standard pumps/fans

2

Line-side components			Load-side power components	
Line reactors	Recommended line-side overcurrent protection devices		Output reactors	dv/dt filters plus VPL
	Fuses IEC-compliant Further information at https://support.industry.siemens.com/cs/cn/en/view/109762896			
	Current			
Article No.	A	Article No.	Article No.	Article No.
A DC link reactor is integrated for frame sizes FSA to FSG – therefore no line reactor is required.	10	3NA3803	A DC link reactor is integrated for frame sizes FSA to FSC – therefore long cable lengths are possible without output reactors.	–
	16	3NA3805		–
	16	3NA3805		–
	16	3NA3805		–
	16	3NA3805		–
	32	3NA3812		–
	32	3NA3812		–
	32	3NA3812		–
	50	3NA3820		–
	50	3NA3820		–
	63	3NA3822	6SL3202-0AE23-8CA0	–
	80	3NA3824	6SE6400-3TC07-5ED0	–
	100	3NA3830		–
	100	3NA3830		–
	125	3NA3832	6SE6400-3TC14-5FD0	–
	160	3NA3836		–
	200	3NA3140		–
	224	3NA3142		–
	300	3NA3250	6SL3000-2BE32-1AA0	–
	315	3NA3252	6SL3000-2BE32-6AA0	–
	355	3NA3254	6SL3000-2BE33-2AA0	–
	400	3NA3260	6SL3000-2BE33-8AA0	–
	630	3NA3372	6SL3000-2BE35-0AA0	–
6SL3000-0CE36-3AA0	630	3NE1437-2	6SL3000-2AE36-1AA0	6SL3000-2DE38-4AA0
6SL3000-0CE37-7AA0	800	3NE1438-2	6SL3000-2AE38-4AA0	
	850	3NE1448-2		
6SL3000-0CE38-7AA0	2 × 500	3NE1334-2 2 fuses	6SL3000-2AE41-0AA0	6SL3000-2DE41-4AA0
6SL3000-0CE41-0AA0	2 × 560	3NE1435-2 2 fuses		
	2 × 630	3NE1436-2 2 fuses	6SL3000-2AE41-4AA0	

Ordering examples

Basic selection	Example 1	Example 2
SINAMICS G120XA converters · degree of protection IP20 · 380 ... 440 V 3 AC, 15 kW · with integrated line filter – converters up to 15 kW delivery ex stock	6SL32 **2** 0-■ **YD28-** 0 C B 0	6SL32 **2** 0-■ **YD28-** 0 C B 0
Article No. supplements		
Environmental class/harmful chemical substances acc. to EN 60721-3-3 Class 3C2 – **delivery ex stock**	**2**	**2**
Operator Panel		
With BOP-2 Basic Operator Panel (numeric 2-line display) – **delivery ex stock**	**2**	
With IOP-2 Intelligent Operator Panel (graphic color display) *		**3**
Line filter		
With integrated line filter Category C3 – **delivery ex stock**	**C**	**C**
Communication		
USS, Modbus RTU, BACnet MS/TP – **delivery ex stock**	**B**	**B**
Complete Article No.	6SL32 2 0- 2 YD28- 0 C B 0	6SL32 2 0- 3 YD28- 0 C B 0
	Delivery ex stock	**Standard delivery time**

* If you select one of these supplements, the delivery time for converters without integrated line filter up to 132 kW or with integrated line filter up to 15 kW will change from "**delivery ex stock**" to "**standard delivery time**".

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0.75 kW to 560 kW

SINAMICS G120XA infrastructure converters for standard pumps/fans

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Technical specifications

Unless explicitly specified otherwise, the following technical specifications are valid for all SINAMICS G120XA converters.

General technical specifications	
Mechanical specifications	
Shock and vibration load	
• Frame sizes FSA to FSG	
- Transport in transport packaging acc. to EN 61800-5-1 and EN 60068-2-6	Class 2M3
- Vibration during operation acc. to EN 60721-3-3: 1995	Class 3M1
• Frame sizes FSH and FSJ	
- Vibration during operation: Test Fc acc. to EN 60068-2-6	0.075 mm at 10 ... 58 Hz 9.81 m/s² (1 × g) at > 58 ... 200 Hz
- Shock during operation: Test acc. to EN 60068-2-27	100 m/s² (10 × g)/11 ms
- Vibration in product packaging: Test Fc acc. to EN 60068-2-64	30 min/axis, 3 axes 10 ... 200 Hz ASD 1.0 (m²/s³)
- Shock in product packaging: Test Fc acc. to EN 60068-2-27	10 × g/11 ms
Degree of protection	
• Frame sizes FSA to FSH	IP20/ UL Open Type
• Frame size FSJ	IP00/ UL Open Type
Permissible mounting position	Vertical wall mounting
Ambient conditions	
Protection class According to EN 61800-5-1	Class III (PELV1) for Power Module Class II (PELV1) for Control Unit
Touch protection According to EN 61800-5-1	Class I (with protective conductor system)
Humidity, max.	<95 %, condensation not permissible
Ambient temperature	
• Storage acc. to EN 60068-2-1	
- Frame sizes FSA to FSG	-40 ... +70 °C (-40 ... +158 °F)
- Frame sizes FSH and FSJ	-25 ... +55 °C (-13 ... +131 °F)
• Transport acc. to EN 60068-2-1	-40 ... +70 °C (-40 ... +158 °F)
• Operation acc. to EN 60068-2-2	
- Frame sizes FSA to FSG	-20 °C ... +60 °C (-4 ... +140 °F) with a side clearance of 5 cm or -20 °C ... +55 °C (-4 ... +131 °F) for side-by-side mounting, >40 °C (104 °F) with derating
- Frame sizes FSH and FSJ	0 ... 50 °C (32 ... 122 °F) with derating Current derating as a function of the ambient temperature
- All frame sizes with operator panel	0 ... 50 °C (32 ... 122 °F) see also derating characteristics
Environmental class in operation	
• Harmful chemical substances	Class 3C2 acc. to EN 60721-3-3
• Organic/biological pollutants	Class 3B1 acc. to EN 60721-3-3
• Degree of pollution	2 acc. to EN 61800
Standards	
Compliance with standards [1]	CE, RCM, RoHS II, EAC
CE marking, according to	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
EMC Directive [1] acc. to EN 61800-3	
• Interference immunity	The SINAMICS G120XA converters are tested according to the interference immunity requirements for environments according to Category C3.
• Interference emissions	
- Frame sizes FSA to FSF without integrated line filter	[2]
- Frame sizes FSA to FSJ with integrated line filter Category C3	Observance of the limit values according to Category C3
	Note: The EMC product standard EN 61800-3 does not apply directly to a frequency converter but to a PDS (Power Drive System), which comprises the complete circuitry, motor and cables in addition to the converter. The frequency converters on their own do not generally require identification according to the EMC Directive.

[1] Additional information is available in the operating instructions on the Internet at: www.siemens.com/sinamics-g120xa/documentation

[2] Non-filtered devices are designed for operation in IT systems or in conjunction with an RCD. The customer must provide suitable RI suppression equipment to ensure that these devices comply with the limits defined for Category C3.

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Technical specifications (continued)

SINAMICS G120XA converters	
Integrated bus interface	
Fieldbus protocols	• USS • Modbus RTU • BACnet MS/TP
Hardware	RS485 connected at a terminal, isolated, USS: max. 187.5 kBaud Modbus RTU: 19.2 kBaud, BACnet MS/TP: max. 187.5 kBaud, bus terminating resistor can be switched in
I/O interfaces	
Signal cable cross-section	0.15 ... 1.5 mm^2 (28 ... 16 AWG)
Digital inputs	6 isolated inputs Optically isolated; Free reference potential (own potential group) NPN/PNP logic can be selected using the wiring
• Switching level: 0 → 1	11 V
• Switching level: 1 → 0	5 V
Digital outputs	1 relay changeover contact 250 V AC, 1 A (inductive load), 30 V DC, 1 A (ohmic load) 3 relay NO contacts 250 V AC, 1 A (inductive load), 30 V DC, 1 A (ohmic load)
Analog inputs	2 analog inputs Differential input Switchable between voltage (-10 ... +10 V) and current (0/4 ... 20 mA) using a DIP switch 12-bit resolution Can be used as additional digital input
• Switching threshold: 0 → 1	4 V
• Switching threshold: 1 → 0	1.6 V
Analog outputs	2 analog outputs Non-isolated output Switchable between voltage (0 ... 10 V) and current (0/4 ... 20 mA) using a parameter Voltage mode: 10 V, min. burden 10 kΩ Current mode: 20 mA, max. burden 500 Ω The analog outputs have short-circuit protection
PTC/KTY interface	1 motor temperature sensor input Connectable sensors PTC, Pt1000, KTY and bimetal, accuracy ±5 °C
Voltage supply for the integrated Control Unit	24 V DC via the Power Module
Tool interfaces	
Memory card	Optional SINAMICS SD card
Operator panels	Optional BOP-2 Basic Operator Panel or IOP-2 Intelligent Operator Panel or SINAMICS G120 Smart Access

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■ Technical specifications (continued)

SINAMICS G120XA converters	
Open-loop/closed-loop control techniques	
V/f linear/quadratic/parameterizable	✓
V/f with flux current control (FCC)	✓
V/f ECO linear/quadratic	✓
Vector control, sensorless	✓
Software functions	
Setpoint input, can be parameterized	✓
Fixed frequencies	16, parameterizable
JOG	✓
Digital motorized potentiometer (MOP)	✓
Ramp smoothing	✓
Extended ramp-function generator (with ramp smoothing OFF3)	✓
Slip compensation	✓
Switchable drive data sets (DDS)	✓ (4)
Switchable command data sets (CDS)	✓ (2)
Flying restart	✓
Automatic restart after line supply failure or operating fault (AR)	✓
Technology controller (internal PID)	✓
Energy saving display	✓
3 additional, free PID controllers	✓
Hibernation mode with internal/external PID controller	✓
Belt monitoring with and without sensor (load torque monitoring)	✓
Dry-running/overload protection monitoring (load torque monitoring)	✓
Deragging	✓
Thermal motor protection	✓ (I^2t, sensor: PTC, Pt1000, KTY and bimetal)
Thermal converter protection	✓
Motor identification	✓
Auto-ramping (V_{dc_max} controller)	✓
Kinetic buffering (V_{dc_min} controller)	✓
Braking functions	
• DC braking	✓
• Compound braking	✓

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■ Technical specifications (continued)

General technical specifications of the power electronics	
System operating voltage • Frame sizes FSA to FSG • Frame sizes FSH and FSJ	 380 ... 440 V 3 AC +10 % -20 % 380 ... 440 V 3 AC +10 % -15 %
Line supply requirements **Line impedance u_K** • Frame sizes FSA to FSC • Frame sizes FSD to FSG • Frame sizes FSH and FSJ	 2 % No restriction A line reactor (u_K = 2 %) must be connected in series, if the short-circuit power ratio R_{SC} > 33 (315 ... 500 kW) or R_{SC} > 20 (560 kW)
Input frequency	47 ... 63 Hz
Output frequency • Frame sizes FSA to FSG • Frame sizes FSH and FSJ	 Control mode V/f: 0 ... 550 Hz Control mode Vector: 0 ... 240 Hz Control mode V/f: 0 ... 100 Hz Control mode Vector: 0 ... 100 Hz
Pulse frequency • Frame sizes FSA to FSG • Frame sizes FSH and FSJ	 4 kHz for converters with a rated power ≤90 kW 2 kHz for converters with a rated power ≥110 kW Higher pulse frequencies up to 16 kHz see derating data 2 kHz Self-adjusting up to 4 kHz see derating data
Power factor λ • Frame sizes FSA to FSG • Frame sizes FSH and FSJ	 0.75 ... 0.93 0.75 ... 0.93 (with line reactor u_K = 2 %)
Offset factor cos φ	0.99
Output voltage, max. as % of line voltage	97 %
Overload capability • Low overload LO	 1.1 × base-load current I_L (i. e. 110 % overload) for 60 s within a cycle time of 600 s
Cooling	Air cooling using an integrated fan
Installation altitude	Up to 1000 m (3281 ft) above sea level without derating, >1000 m (3281 ft) see derating characteristics
Short Circuit Current Rating (SCCR), max.	100 kA see Recommended line-side overcurrent protection devices – the value depends on the fuses and circuit breakers used For more information, see: https://support.industry.siemens.com/cs/cn/en/view/109762896
Protection functions	• Undervoltage • Overvoltage • Overcurrent/overload • Ground fault • Short-circuit • Stall protection • Motor blocking protection • Motor overtemperature • Converter overtemperature • Parameter locking

Maximum permissible motor cable lengths SINAMICS G120XA

The values specified in the table below apply with low-capacitance CY cables and with pulse frequencies set in the factory.

	Maximum permissible motor cable lengths (shielded/unshielded) in m (ft)			
	FSA to FSC	**FSD and FSE**	**FSF and FSG**	**FSH and FSJ**
Without compliance to the EMC category				
Converters without optional power components	100/150 (328/492)	200/300 (656/984)	300/450 (984/1476)	150/200 (492/656)
Converters with optional output reactor	–	200/300 (656/984) [1]	300/450 (984/1476) [1]	300/450 (984/1476)
Converters with optional dv/dt filter plus VPL	–	–	–	300/450 (984/1476)
With compliance to the EMC category				
Converters with integrated line filter Category C3 to comply with radio interference emissions according to EN 61800-3 EMC Category C3	50/– (164/–)	100/– (328/–)	150/– (492/–)	100/– (328/–)

[1] For frame sizes FSD to FSG the maximum permissible cable lengths are not increased with an output reactor. By means of the output reactor, the loading of the motor windings is reduced by lower rates of voltage rise (*dv/dt*). By means of two output reactors connected in series, the maximum permissible cable lengths for frame sizes FSD and FSE are increased to 350 m (1148 ft) (shielded) and 525 m (1723 ft) (unshielded), and for frame sizes FSF and FSG to 525 m (1723 ft) (shielded) and 800 m (2625 ft) (unshielded).

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■ Configuration

The following electronic configuring aids and engineering tools are available for the SINAMICS G120XA:

Drive Technology Configurator (DT Configurator)

Drive Technology Configurator (DT Configurator) within the CA 01

The Interactive Catalog CA 01 - the offline Industry Mall of Siemens - contains over 100000 products with approximately 5 million possible drive system product variants. The Drive Technology Configurator (DT Configurator) has been developed to facilitate selection of the correct motor and/or converter from the wide spectrum of drives. It is integrated as a selection tool in Catalog CA 01.

Online DT Configurator

In addition, the DT Configurator can be used on the Internet without requiring any installation. The DT Configurator can be found in the Siemens Industry Mall at the following address:

www.siemens.com.cn/dt-configurator

You can find further information on the Drive Technology Configurator (DT Configurator) in the section Engineering tools.

SinaSave energy efficiency tool

Use SinaSave to calculate potential energy savings

The web-based tool SinaSave can be used to estimate the potential savings which can be achieved over the entire lifecycle, e.g. for pump and fan applications, thanks to SINAMICS. The tool takes into consideration all important plant-specific quantities, such as the power and load data of the application, the relevant control mode and the operation profile for the application in question. The result delivered by the tool specifies the potential energy savings which can be achieved with the specific application in conjunction with the Integrated Drive System or the drive component. The tool also provides a monetary evaluation of the potential savings and estimates the payback period.

For more information about the amortization calculator for energy-efficient drive systems, visit

www.siemens.com/sinasave

You can find further information on the SinaSave energy efficiency tool in the section Engineering tools.

SINAMICS Web server for SINAMICS G120XA via SINAMICS G120 Smart Access

Web server for efficient commissioning, diagnostics and maintenance

Thanks to the optionally available SINAMICS G120 Smart Access, the SINAMICS G210XA drive system offers a web server for efficient commissioning, diagnostics and maintenance options. The web server provides access to a multi-faceted range of new options for parameter assignment and drive diagnostics for laptops, tablets and smartphones.

You can find further information on the SINAMICS Web server for SINAMICS G120XA via SINAMICS G120 Smart Access in the section Engineering tools.

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■ **Characteristic curves**

Derating data

Pulse frequency

Frame size	Rated power [1] at 50 Hz 400 V 3 AC kW	Rated output current in A (at an ambient temperature of 40 °C (104 °F)) for a pulse frequency of							
		2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 kHz	14 kHz	16 kHz
FSA	0.75	2.2	**2.2**	1.87	1.54	1.32	1.1	0.99	0.88
	1.1	3.1	**3.1**	2.64	2.17	1.86	1.55	1.4	1.24
	1.5	4.1	**4.1**	3.49	2.87	2.46	2.05	1.85	1.64
	2.2	5.6	**5.6**	4.76	3.92	3.36	2.8	2.52	2.24
	3	7.3	**7.3**	6.21	5.11	4.38	3.65	3.29	2.92
FSB	4	8.8	**8.8**	7.48	6.16	5.28	4.4	3.96	3.52
	5.5	12.5	**12.5**	14.03	8.75	7.5	6.25	5.63	5
	7.5	16.5	**16.5**	15.3	11.48	9.9	8.25	7.43	6.6
FSC	11	25	**25**	21.25	17.5	15	12.5	11.25	10
	15	31	**31**	26.35	21.7	18.6	15.5	13.95	12.4
FSD	18.5	37	**37**	31.4	25.9	22.2	18.5	16.6	14.8
	22	43	**43**	36.5	30.1	25.8	21.5	19.3	17.2
	30	58	**58**	49.3	40.6	34.8	29	26.1	23.2
	37	68	**68**	57.8	47.6	40.8	34	30.6	27.2
	45	82.5	**82.5**	70.1	57.7	49.4	41.2	37.1	33
FSE	55	103	**103**	87.5	72.1	61.8	51.5	46.3	41.2
FSF	75	136	**136**	115.6	95.2	81.6	68	61.2	54.4
	90	164	**164**	139.4	114.8	98.4	82	73.8	65.6
	110	**201**	141	101	80.4	–	–	–	–
	132	**237**	166	119	94.8	–	–	–	–
FSG	160	**289**	194	139	111	–	–	–	–
	200	**364**	244	174	139	–	–	–	–
	250	**436**	305	218	174	–	–	–	–
FSH [2]	315	**590**	472	–	–	–	–	–	–
	355	**645**	516	–	–	–	–	–	–
	400	**725**	580	–	–	–	–	–	–
FSJ [2]	450	**820**	656	–	–	–	–	–	–
	500	**895**	716	–	–	–	–	–	–
	560	**1015**	812	–	–	–	–	–	–

The rated output currents indicated in **bold** are valid for the standard pulse frequency.

[1] Rated power based on the rated output current I_{rated}. The rated output current I_{rated} is based on the duty cycle for low overload (LO).

[2] With the factory setting these converters start at a pulse frequency of 4 kHz and automatically reduce the pulse frequency under load to the corresponding required frequencies. The pulse frequency increases automatically up to 4 kHz with decreasing load. The rated current values refer to a pulse frequency of 2 kHz and are reached at any time by automatic adaptation of the output pulse frequency.

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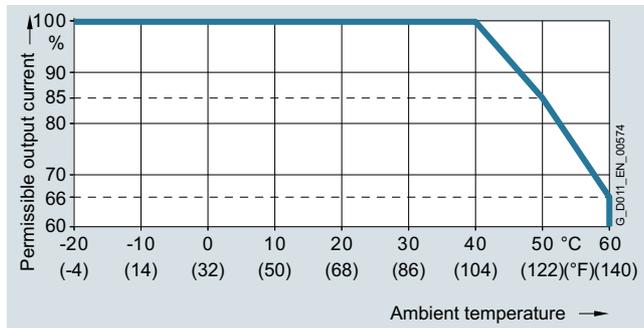
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SINAMICS G120XA infrastructure converters for standard pumps/fans

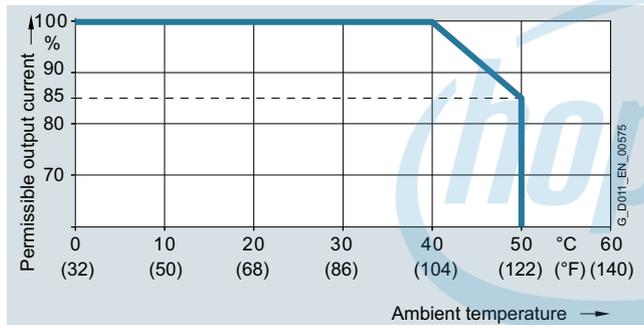### ■ Characteristic curves (continued)

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Ambient temperature

Frame sizes FSA to FSG:

Permissible output current as a function of the ambient temperature for SINAMICS G120XA, frame sizes FSA to FSG, for low overload (LO)

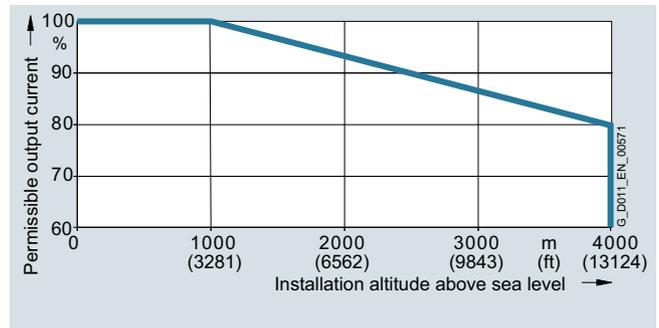**Frame sizes FSH and FSJ:**

Permissible output current as a function of the ambient temperature for SINAMICS G120XA, frame sizes FSH and FSJ, for low overload (LO)

The operating temperature ranges of the Operator Panels should be taken into account.

Installation altitude

Frame sizes FSA to FSJ:

Permissible output current as a function of the installation altitude for SINAMICS G120XA for low overload (LO)

The connected motors, power elements and components must be considered separately.

Permissible line supplies as a function of the installation altitude

• Installation altitude up to 2000 m (6562 ft) above sea level
  - Connection to every supply system permitted for the converter

• Installation altitudes between 2000 m (6562 ft) and 4000 m (13124 ft) above sea level
  - Connection only to a TN system with grounded neutral point
  - TN systems with grounded line conductor are not permitted
  - The TN line system with grounded neutral point can also be supplied using an isolation transformer
  - The phase-to-phase voltage does not have to be reduced

System operating voltage

Frame sizes FSA to FSG:
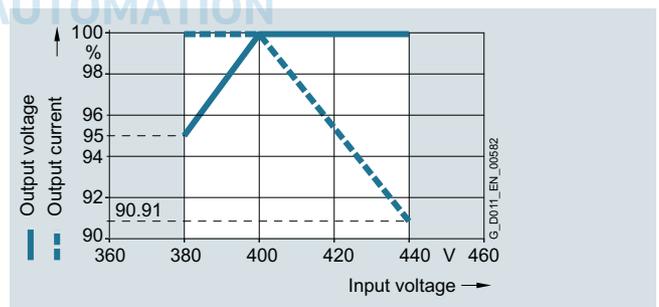
Permissible output current and output voltage as a function of the input voltage for SINAMICS G120XA, frame sizes FSA to FSG, for low overload (LO)
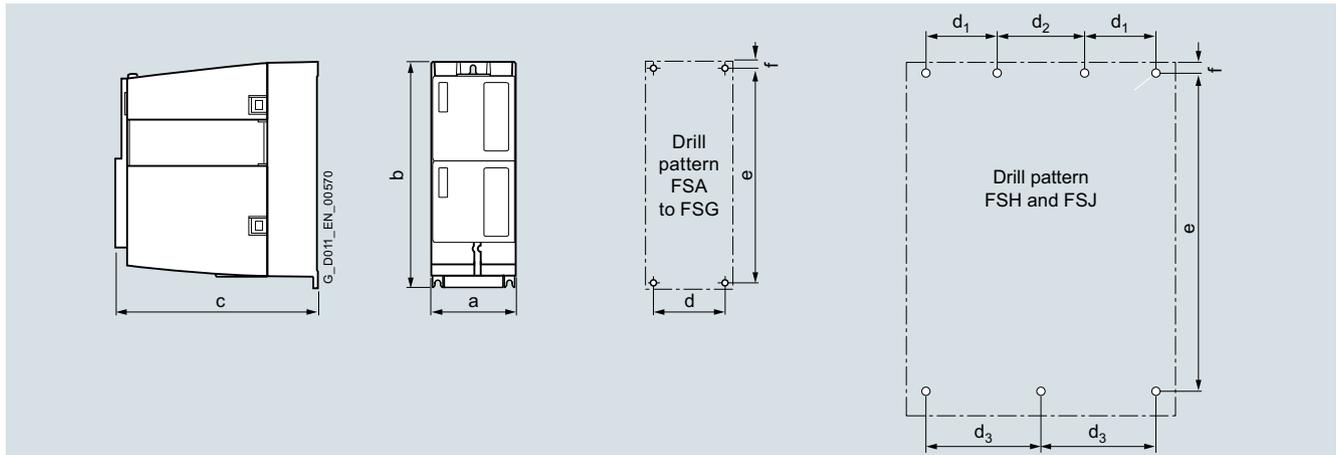
Frame sizes FSH and FSJ:

Frame size	Rated power [1]	Rated output current	Base-load current [2]	Rated output current in % at a line voltage of			
	kW	A	A	380 V	400 V	415 V	440 V
FSH	315	605	590	100 %	96.3 %	93.5 %	88.8 %
	355	670	645	100 %	96.1 %	93.2 %	88.3 %
	400	750	725	100 %	96.3 %	93.6 %	89 %
FSJ	450	840	820	100 %	95.6 %	92.3 %	86.8 %
	500	925	895	100 %	95.3 %	91.7 %	85.8 %
	560	1035	1015	100 %	95.8 %	92.7 %	87.5 %

[1] Rated power based on the rated output current I_{rated}. The rated output current I_{rated} is based on the duty cycle for low overload (LO).

[2] The base-load current is based on the duty cycle for low overload (LO).

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■ Dimensional drawings

Principle dimension drawing and drill pattern for SINAMICS G120XA

Frame size	Dimensions in mm (inches)			Drilling dimensions in mm (inches)						Cooling clearance [2] in mm (inches)			Mounting
	a (width)	b (height)	c (depth) [1]	d	d_1	d_2	d_3	e	f	top	bottom	front	With screws (plus washers and nuts)
FSA	73 (2.87)	232 (9.13)	209 (8.23)	55 (2.17)	–	–	–	221.5 (8.72)	5.5 (0.22)	80 (3.15)	100 (3.94)	0 (0)	4 × M4
FSB	100 (3.94)	275 (10.83)	209 (8.23)	80 (3.15)	–	–	–	265 (10.43)	7 (0.28)	80 (3.15)	100 (3.94)	0 (0)	4 × M4
FSC	140 (5.51)	295 (11.61)	209 (8.23)	118 (4.65)	–	–	–	283 (11.14)	7 (0.28)	80 (3.15)	100 (3.94)	0 (0)	4 × M5
FSD	200 (7.87)	472 (18.58)	239 (9.41)	170 (6.69)	–	–	–	430 (16.93)	15 (0.59)	300 (11.81)	350 (13.78)	0 (0)	4 × M5
FSE	275 (10.83)	551 (21.69)	239 (9.41)	230 (9.06)	–	–	–	509 (20.04)	11 (0.43)	300 (11.81)	350 (13.78)	0 (0)	4 × M6
FSF	305 (12.01)	709 (27.91)	360 (14.17)	270 (10.63)	–	–	–	680 (26.77)	16.6 (0.65)	300 (11.81)	350 (13.78)	0 (0)	4 × M8
FSG	305 (12.01)	999 (39.33)	360 (14.17)	265 (10.43)	–	–	–	970.5 (38.21)	18.5 (0.73)	300 (11.81)	350 (13.78)	0 (0)	4 × M10
FSH	548 (21.57)	1487 (58.54)	410 (16.14)	–	150 (5.91)	150 (5.91)	225 (8.86)	1444 (56.85)	21 (0.83)	200 (7.87)	200 (7.87)	100 (3.94)	7 × M8
FSJ	801 (31.54)	1438 (56.61)	410 (16.14)	–	200 (7.87)	290 (11.42)	345 (13.58)	1399 (55.08)	21 (0.83)	200 (7.87)	200 (7.87)	100 (3.94)	7 × M8

■ More information

Compact Installation Instructions are supplied in hard copy form in English and Chinese with every SINAMICS G120XA. Further documentation, such as the operating instructions, is available free on the Internet at:
www.siemens.com/sinamics-g120xa/documentation

Detailed information on the SINAMICS G120XA infrastructure converters for standard pumps/fans, including the latest technical documentation (brochures, tutorials, dimensional drawings, certificates and operating instructions), is available on the Internet at:
www.siemens.com.cn/sinamics-g120xa

and is also available via the Drive Technology Configurator (DT Configurator) on the Internet.

The DT Configurator can be found in the Siemens Industry Mall at the following address:
www.siemens.com.cn/dt-configurator

[1] Increased depth for frame sizes FSA to FSG:
- When the operator panel is plugged on, the depth increases by 9 mm (0.35 in)
- When the SINAMICS G120 Smart Access is plugged on, the depth increases by 7 mm (0.28 in)

[2] The converters with frame sizes FSA to FSG can be mounted side by side. A side clearance of 1 mm (0.04 in) is recommended for tolerance-related reasons. For frame sizes FSH and FSJ, a side clearance of 30 mm (1.18 in) between the converters is required.

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Supplementary system components   > Operator panels

■ Overview

Operator panel	IOP-2 and IOP-2 Handheld Intelligent Operator Panel		BOP-2 Basic Operator Panel
Description			
	Thanks to the high-contrast color display, menu-based operation and the wizards, commissioning of the standard drives is easy. Application wizards guide the user through the commissioning of important applications such as pumps, fans, compressors, or conveyor systems.		Commissioning of standard drives is easy with the menu-prompted dialog on a 2-line display. Simultaneous display of the parameter and parameter value, as well as parameter filtering, means that basic commissioning of a drive can be performed easily and, in most cases, without a printed parameter list.
Possible applications	• Can be mounted directly on the converter • Can be mounted in a control cabinet door using a door mounting kit (achievable degree of protection is IP55/UL Type 12 enclosure) • Available as handheld version • The following languages are integrated in the IOP-2: English, German, French, Italian, Spanish, Portuguese, Dutch, Swedish, Finnish, Russian, Czech, Polish, Turkish, Chinese Simplified		• Can be mounted directly on the converter • Can be mounted in the control cabinet door using a door mounting kit (achievable degree of protection is IP55/UL Type 12)
Quick commissioning without expert knowledge	• Standard commissioning using the clone function • For quicker access, the parameter block names can be directly entered respectively changed on the IOP-2 using the virtual keyboard. • User-defined parameter list with a reduced number of self-selected parameters • Simple commissioning of standard applications using application-specific wizards; it is not necessary to know the parameter structure • Simple local commissioning using the handheld version • Commissioning is possible largely without documentation		• Standard commissioning using the clone function
High degree of operator friendliness and intuitive operation	• Intuitive navigation by operating with a sensor control field • Graphic color display to show status values such as pressure or flow rate in the form of scalar values, bar-type diagrams, or trend displays • Status display with freely selectable units to specify physical values • Direct manual operation of the drive – you can simply toggle between the automatic and manual modes • Simple cloning of specific settings of the IOP-2 user interface.		• 2-line display for showing up to 2 process values with text • Status display of predefined units • Direct manual operation of the drive – you can simply toggle between the automatic and manual modes
Minimization of maintenance times	• Diagnostics using plain text display, can be used locally on-site without documentation • The support function is used to determine the drive data for the Power Module, Control Unit and IOP-2 and makes this available as a two-dimensional code (data matrix/QR code) • Easily upgradable to new functional status via USB interface		• Diagnostics with menu prompting with 7-segment display

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CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG
SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

Supplementary system components   > IOP-2 Intelligent Operator Panel

2

■ **Overview**

IOP-2 Intelligent Operator Panel

IOP-2 Intelligent Operator Panel

The Intelligent Operator Panel IOP-2 is a very user-friendly and powerful operator panel for the SINAMICS G120, SINAMICS G120C, SINAMICS G120X, SINAMICS G120XA, SINAMICS G110D, SINAMICS G120D, SINAMICS G110M and SIMATIC ET 200pro FC-2.

The IOP-2 supports both newcomers and drive experts. Thanks to the membrane keyboard with a central sensor control field, high-contrast color displays, menu-based operation and application wizards, it is easy to commission drives. A drive can be essentially commissioned without having to use a printed parameter list – as the parameters are displayed in plain text, and explanatory help texts and the parameter filtering function are provided.

Application wizards interactively guide you when commissioning important applications such as conveyor technology, pumps, fans and compressors. There is a basic commissioning wizard for general commissioning.

Up to two process values can be graphically visualized and up to four process values can be numerically visualized on the status screen/display. Process values can also be displayed in technological units.

The IOP-2 supports standard commissioning of identical drives. For this purpose, a parameter list can be copied from a converter into the IOP-2 and downloaded into other drive units of the same type as required.

The IOP-2 can be installed in control cabinet doors using the optionally available door mounting kit.

Updating the IOP-2

The IOP-2 can be updated and expanded using the integrated USB interface.

Data to support future drive systems can be transferred from the PC to the IOP-2. Further, the USB interface allows user languages and wizards that will become available in the future to be subsequently downloaded and the firmware to be updated for the IOP-2 [1].

The IOP-2 is supplied with power via the USB interface during an update.

IOP-2 Handheld

IOP-2 Handheld

A handheld version of the IOP-2 can be ordered for mobile use. In addition to the IOP-2, it includes a housing with rechargeable batteries, a charging unit, an RS232 connecting cable, and a USB cable. The charging unit is supplied with connector adapters for Europe, the US and UK. When the batteries are fully charged, the operating time is up to 10 hours.

To connect the IOP-2 Handheld to SINAMICS G110D, SINAMICS G120D, SINAMICS G110M and SIMATIC ET 200pro FC-2, the RS232 connecting cable with optical interface is required in addition.

[1] Information on updates for the IOP-2 is available at
https://support.industry.siemens.com/cs/document/67273266

CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG
SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

Supplementary system components   > IOP-2 Intelligent Operator Panel

2

Selection and ordering data

Description	Article No.
IOP-2 Intelligent Operator Panel	**6SL3255-0AA00-4JA2**
For use with SINAMICS G120 SINAMICS G120C SINAMICS G120X SINAMICS G120XA SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2	
Operating languages: English, German, French, Italian, Spanish, Portuguese, Dutch, Swedish, Finnish, Russian, Czech, Polish, Turkish, Chinese Simplified	
IOP-2 Handheld For use with SINAMICS G120 SINAMICS G120C SINAMICS G120X SINAMICS G120XA SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2	**6SL3255-0AA00-4HA1**
Included in the scope of delivery:	
• IOP-2	
• Handheld housing	
• Rechargeable batteries (4 × AA)	
• Charging unit (international)	
• RS232 connecting cable[1] 3 m (9.84 ft) long, can be used in combination with SINAMICS G120 SINAMICS G120C SINAMICS G120X SINAMICS G120XA	
• USB cable 1 m (3.28 ft) long	
Accessories	
Door mounting kit For mounting an operator panel in control cabinet doors with sheet steel thicknesses of 1 ... 3 mm (0.04 in ... 0.12 in) Degree of protection IP55 Included in the scope of delivery:	**6SL3256-0AP00-0JA0**
• Seal	
• Mounting material	
• Connecting cable 5 m (16.4 ft) long, also supplies voltage to the IOP-2 directly via the converter	
RS232 connecting cable 2.5 m (8.20 ft) long, with optical interface for connecting the IOP-2 Handheld to SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2	**3RK1922-2BP00**

Benefits

- New device design
  - Intuitive user interface – membrane keyboard with central sensor control field
  - High-contrast color display with a range of display options
  - IOP-2 device design open for future functional expansions (e.g. device functions, wizards, languages)
  - Easily upgradable to new functional status via USB interface
- Commissioning
  - Simple commissioning via wizards
  - The "Fieldbus Interface Settings" wizard is used for easy configuration of the Ethernet interface
  - Fast standard commissioning of converters thanks to cloning function
  - For quicker access, the parameter block names can be directly entered respectively changed on the IOP-2 using the virtual keyboard.
  - Simple local commissioning on-site using the handheld version
- Operator control and monitoring
  - Simple, individual local drive control (start/stop, setpoint value specification, change in direction of rotation)
  - Application-specific scenarios such as operator concepts with additional external operating elements can be implemented easily
  - Simple cloning of specific settings of the IOP-2 user interface, such as status screen, language settings, lighting duration, date/time settings, parameter backup mode and "My Parameters" – settings made once such be easily transferred to many further IOP-2 Intelligent Operator Panels
- Diagnostics
  - Rapid diagnostics thanks to on-site plain text display
  - Integrated plain text help function for local display and resolution of fault messages
- Support function
  - Used to determine the drive data for the Power Module, Control Unit and IOP-2 (article number, serial number, firmware version, error statuses) and makes this available as a two-dimensional code (data matrix/QR code)
  - Allows easy contact with Customer Support via a data matrix/QR code generated on the IOP-2
  - Quick access via mobile devices (e.g. smartphones, tablets) to product information, documentation, FAQs, contact persons via a two-dimensional code generated on the IOP-2 (data matrix/QR code)
  - Scanning and evaluating of the two-dimensional data matrix code using the Industry Online Support app (https://support.industry.siemens.com/cs/ww/en/sc/2067), see also: https://support.industry.siemens.com/cs/document/109748340

[1] For use in conjunction with SINAMICS G110D, SINAMICS G120D, SINAMICS G110M and SIMATIC ET 200pro FC-2, the RS232 connecting cable with optical interface is required (Article No.: **3RK1922-2BP00**). The cable must be ordered separately.

Hotline: 1900.6536 – Website: HOPLONGTECH.COM

■ Integration

Using the IOP-2 with the converters

	• SINAMICS G120 with CU230P-2, CU240E-2 or CU250S-2 • SINAMICS G120C • SINAMICS G120X and SINAMICS G120XA	• SINAMICS G110D • SINAMICS G120D • SINAMICS G110M • SIMATIC ET 200pro FC-2
Plugging the IOP-2 onto the converter (Voltage supply via converter)	✓	–
Door mounting of the IOP-2 with the door mounting kit (Voltage supply via converter. For this purpose, the IOP-2 must be connected up by means of the connecting cable supplied with the door mounting kit.)	✓	–
Mobile use of the IOP-2 Handheld (supplied from rechargeable batteries)	✓	✓ (RS232 connecting cable with optical interface required, article number 3RK1922-2BP00)

Door mounting

Using the optionally available door mounting kit, an operator panel can be simply mounted in a control cabinet door with just a few manual operations. In the case of door mounting, the IOP-2 Operator Panel achieves degree of protection IP55/UL Type 12 enclosure.
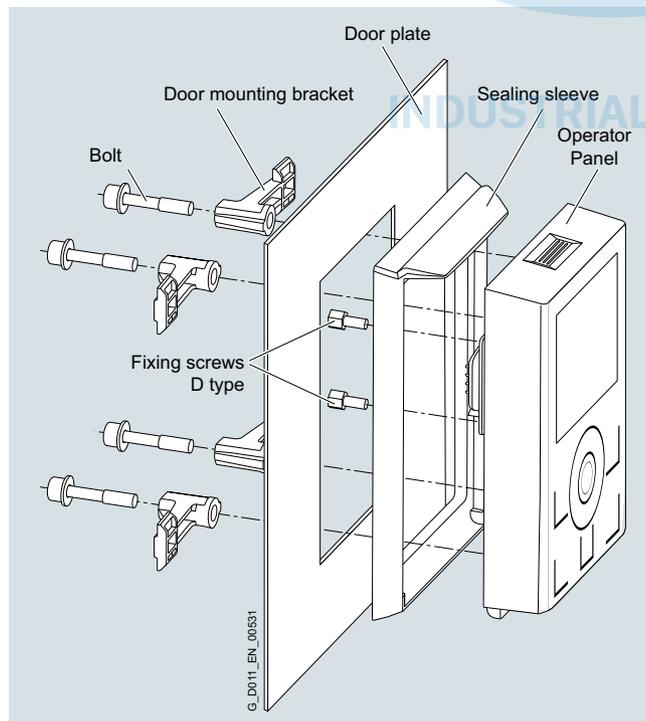
Door mounting kit with plugged-on IOP-2

■ Technical specifications

	IOP-2 6SL3255-0AA00-4JA2	IOP-2 Handheld 6SL3255-0AA00-4HA1
Display	High-contrast color display, a variety of display options	
• Resolution	320 × 240 pixels	
Operator panel	Membrane keyboard with central sensor control field	
Operating languages	English, German, French, Italian, Spanish, Portuguese, Dutch, Swedish, Finnish, Russian, Czech, Polish, Turkish, Chinese Simplified	
Ambient temperature		
• During transport and storage	-40 ... +70 °C (-40 ... +158 °F)	-20 ... +55 °C (-4 ... +131 °F)
• During operation	For direct mounting on the converter: 0 ... 50 °C (32 ... 122 °F) For installation with door mounting kit: 0 ... 55 °C (32 ... 131 °F)	0 ... 40 °C (32 ... 104 °F)
Humidity	Relative humidity < 95 %, non-condensing	
Degree of protection	For direct mounting on the converter: IP20 For installation with door mounting kit: IP55, UL Type 12 enclosure	IP20
Dimensions (H × W × D)	106.86 × 70 × 19.65 mm (4.21 × 2.76 × 0.77 in)	195.04 × 70 × 37.58 mm (7.68 × 2.76 × 1.48 in)
Weight, approx.	0.134 kg (0.3 lb)	0.724 kg (1.6 lb)
Compliance with standards	CE, RCM, cULus, EAC, KC-REM-S49-SINAMICS	

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CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG

SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

■ Overview

BOP-2 Basic Operator Panel

The Basic Operator Panel BOP-2 can be used to commission drives, monitor drives in operation and input individual parameter settings.

Commissioning of standard drives is easy with the menu-prompted dialog on a 2-line display. Simultaneous display of the parameter and parameter value, as well as parameter filtering, means that basic commissioning of a drive can be performed easily and, in most cases, without a printed parameter list.

The drives are easily controlled manually using directly assigned navigation buttons. The BOP-2 has a dedicated switchover button to switch from automatic to manual mode.

Diagnostics can easily be performed on the connected converter by following the menus.

Up to two process values can be numerically visualized simultaneously.

BOP-2 supports standard commissioning of identical drives. For this purpose, a parameter list can be copied from a converter into the BOP-2 and when required, downloaded into other drive units of the same type.

The operating temperature of the BOP-2 is 0 °C ... 50 °C (32 °F ... 122 °F).

■ Selection and ordering data

Description	Article No.
BOP-2 Basic Operator Panel	**6SL3255-0AA00-4CA1**
Accessories	
Door mounting kit For mounting an operator panel in control cabinet doors with sheet steel thicknesses of 1 ... 3 mm (0.04 ... 0.12 in) Degree of protection IP55 Included in the scope of delivery: • Seal • Mounting material • Connecting cable (5 m/16.4 ft long, also supplies voltage to the operator panel directly via the converter)	**6SL3256-0AP00-0JA0**

■ Benefits

- Shorten commissioning times – Easy commissioning of standard drives using basic commissioning wizards (setup)
- Minimize standstill times – Fast detection and rectification of faults (Diagnostics)
- Greater transparency in the process – The status display of the BOP-2 makes process variable monitoring easy (Monitoring)
- Direct mounting on the converter
- User-friendly user interface:
  - Easy navigation using clear menu structure and clearly assigned control keys
  - Two-line display

■ **Overview**

SINAMICS SD memory card

The parameter settings for a converter can be stored on the SINAMICS SD memory card. When service is required, e.g. after the converter has been replaced and the data have been downloaded from the memory card, the drive system is immediately ready for use again.

- Parameter settings can be written from the memory card to the converter or saved from the converter to the memory card.
- Up to 100 parameter sets can be stored.
- The memory card supports standard commissioning without the use of an operator panel such as the IOP-2 or BOP-2.
- If firmware is stored on the memory card, the firmware can be upgraded/downgraded during power-up.

Note:

The memory card is not required for operation and does not have to remain inserted.

■ **Selection and ordering data**

Description	Article No.
SINAMICS SD card 512 MB, empty	**6SL3054-4AG00-2AA0**

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SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

Supplementary system components > SINAMICS G120 Smart Access

Overview

SINAMICS G120 Smart Access

It is also easy and convenient to commission and operate the SINAMICS G120, SINAMICS G120C, SINAMICS G120X and SINAMICS G120XA converters of firmware V4.7 SP6 and higher using the web server module SINAMICS G120 Smart Access and a connected smartphone, tablet or laptop.

Benefits

- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to the optional SINAMICS G120 Smart Access
- Easy access to the converter in difficult-to-access areas
- Intuitive user interface and commissioning wizard
- Free choice of terminal devices as the web server works with all common web browsers, such as iOS, Android, Windows, Linux and Mac OS

Function

- Commissioning using commissioning wizard
- Setting and saving parameters
- Testing motor in JOG mode
- Monitoring of converter data
- Quick diagnostics
- Saving the settings and restoring to factory settings

Selection and ordering data

Description	Article No.
SINAMICS G120 Smart Access For wireless commissioning, operation and diagnostics of the following converters using a smartphone, tablet or laptop • SINAMICS G120C • SINAMICS G120 together with the CU230P-2 and CU240E-2 Control Units (without fail-safe versions) • SINAMICS G120X and SINAMICS G120XA	**6SL3255-0AA00-5AA0**

Technical specifications

	SINAMICS G120 Smart Access 6SL3255-0AA00-5AA0
Operating system	iOS, Android, Windows, Linux, Mac OS
Languages	Support of six languages: English, French, German, Italian, Spanish, Chinese
Ambient temperature	
• During storage and transport	-40 ... +70 °C (-40 ... +158 °F)
• During operation	0 ... 50 °C (32 ... 122 °F) if the Smart Access is plugged directly into the converter
Humidity	< 95 %, non-condensing
Degree of protection	Depending on the degree of protection of the converter, max. IP55/UL Type 12 enclosure
Dimensions	
• Width	70 mm (2.76 in)
• Height	108.9 mm (4.29 in)
• Depth	17.3 mm (0.68 in)
Weight, approx.	0.08 kg (0.18 lb)
Compliance with standards	CE, FCC, SRRC, WPC, ANATEL, BTK

Integration

SINAMICS G120XA frame size FSD with plugged-on SINAMICS G120 Smart Access

The optional SINAMICS G120 Smart Access is simply plugged onto the converter and is available for the following converters of firmware V4.7 SP6 and higher.
- SINAMICS G120C
- SINAMICS G120 together with the CU230P-2 and CU240E-2 Control Units (without fail-safe versions)
- SINAMICS G120X and SINAMICS G120XA

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SINAMICS G120XA infrastructure converters for standard pumps/fans
0.75 kW to 560 kW

Overview

A shield connection kit is supplied with the SINAMICS G120XA converters, frame size FSA. It is advisable to install the supplied shield connection kit for EMC-compliant configuration of the converter.

The shield connection kits for the Power Module are not included in the scope of delivery for the SINAMICS G120XA converters, frame sizes FSB to FSG, but they can be ordered as an option.

Please observe the notes included in the operating instructions for the SINAMICS G120XA converters, frame sizes FSH and FSJ.

www.siemens.com/sinamics-g120xa/documentation

Selection and ordering data

Description	Article No.
Shield connection kits for Power Module for SINAMICS G120XA	
• Frame size FSA	Included in the scope of delivery of the converters, can be ordered as spare part
• Frame size FSB (available soon)	**6SL3262-1AB01-0DA0**
• Frame size FSC (available soon)	**6SL3262-1AC01-0DA0**
• Frame size FSD	**6SL3262-1AD01-0DA0**
• Frame size FSE	**6SL3262-1AE01-0DA0**
• Frame size FSF	**6SL3262-1AF01-0DA0**
• Frame size FSG	**6SL3262-1AG01-0DA0**

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INDUSTRIAL AUTOMATION

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Appendix

Metal surcharges

Explanation of the raw material/metal surcharges [1]

Surcharge calculation

To compensate for variations in the price of the raw materials silver, copper, aluminum, lead, gold, dysprosium [2] and/or neodym [2], surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The surcharges are calculated in accordance with the following criteria:

- Basic official price of the raw material
  Basic official price from the day prior to receipt of the order or prior to release order (daily price) for [3]
  - Silver (sales price, processed)
  - Gold (sales price, processed)

  and for [4]
  - Copper (lower DEL notation + 1 %)
  - Aluminum (aluminum in cables)
  - Lead (lead in cables)
- Metal factor of the products
  Certain products are displayed with a metal factor. The metal factor determines the official price (for those raw materials concerned) as of which the metal surcharges are applied and the calculation method used (weight or percentage method). An exact explanation is given below.

Structure of the metal factor

The metal factor consists of several digits; the first digit indicates whether the percentage method of calculation refers to the list price or a possible discounted price (customer net price) (L = list price / N = customer net price).

The remaining digits indicate the method of calculation used for the respective raw material. If no surcharge is added for a raw material, a "-" is used.

1st digit	List or customer net price using the percentage method
2nd digit	for silver (AG)
3rd digit	for copper (CU)
4th digit	for aluminum (AL)
5th digit	for lead (PB)
6th digit	for gold (AU)
7th digit	for dysprosium (Dy) [2]
8th digit	for neodym (Nd) [2]

Weight method

The weight method uses the basic official price, the daily price and the raw material weight. In order to calculate the surcharge, the basic official price must be subtracted from the daily price. The difference is then multiplied by the raw material weight.

The basic official price can be found in the table below using the number (1 to 9) of the respective digit of the metal factor. The raw material weight can be found in the respective product descriptions.

Percentage method

Use of the percentage method is indicated by the letters A-Z at the respective digit of the metal factor.

The surcharge is increased - dependent on the deviation of the daily price compared with the basic official price - using the percentage method in "steps" and consequently offers surcharges that remain constant within the framework of this "step range". A higher percentage rate is charged for each new step. The respective percentage level can be found in the table below.

Metal factor examples

L E A – – – – –

- Basis for % surcharge: List price
- Silver Basis 150 €, Step 50 €, 0.5 %
- Copper Basis 150 €, Step 50 €, 0.1 %
- No surcharge for aluminum
- No surcharge for lead
- No surcharge for gold
- No surcharge for dysprosium
- No surcharge for neodym

N – A 6 – – – –

- Basis for % surcharge: Customer net price
- No surcharge for silver
- Copper Basis 150 €, Step 50 €, 0.1 %
- Aluminum acc. to weight, basic offic. price 225 €
- No surcharge for lead
- No surcharge for gold
- No surcharge for dysprosium
- No surcharge for neodym

– – 3 – – – – –

- No basis necessary
- No surcharge for silver
- Copper acc. to weight, basic official price 150 €
- No surcharge for aluminum
- No surcharge for lead
- No surcharge for gold
- No surcharge for dysprosium
- No surcharge for neodym

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1) Refer to the separate explanation on the next page regarding the raw materials dysprosium and neodym (= rare earths).
2) For a different method of calculation, refer to the separate explanation for these raw materials on the next page.
3) Source: Umicore, Hanau (www.metalsmanagement.umicore.com).
4) Source: Schutzvereinigung DEL-Notiz e.V. (www.del-notiz.org).

Hotline: 1900.6536 - Website: HOPLONGTECH.COM

■ **Explanation of the raw material/metal surcharges for dysprosium and neodym (rare earths)**

Surcharge calculation

To compensate for variations in the price of the raw materials silver [1], copper [1], aluminum [1], lead [1], gold [1], dysprosium and/or neodym, surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. The surcharge for dysprosium and neodym is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The surcharge is calculated in accordance with the following criteria:

• Basic official price of the raw material [2]
  Three-month basic average price (see below) in the period before the quarter in which the order was received or the re-lease order took place (= average official price) for
  - dysprosium (Dy metal, 99 % min. FOB China; USD/kg)
  - neodym (Nd metal, 99 % min. FOB China; USD/kg)
• Metal factor of the products
  Certain products are displayed with a metal factor. The metal factor indicates (for those raw materials concerned) the basic official price as of which the surcharges for dysprosium and neodym are calculated using the weight method. An exact explanation of the metal factor is given below.

Three-month average price

The prices of rare earths vary according to the foreign currency, and there is no freely accessible stock exchange listing. This makes it more difficult for all parties involved to monitor changes in price. In order to avoid continuous adjustment of the surcharges, but to still ensure fair, transparent pricing, an average price is calculated over a three-month period using the average monthly foreign exchange rate from USD to EUR (source: European Central Bank). Since not all facts are immediately available at the start of each month, a one-month buffer is allowed before the new average price applies.

Examples of calculation of the average official price:

Period for calculation of the average price:	Period during which the order/release order is effected and the average price applies:
Sep 2012 - Nov 2012	Q1 in 2013 (Jan - Mar)
Dec 2012 - Feb 2013	Q2 in 2013 (Apr - Jun)
Mar 2013 - May 2013	Q3 in 2013 (Jul - Sep)
Jun 2013 - Aug 2013	Q4 in 2013 (Oct - Dec)

Structure of the metal factor

The metal factor consists of several digits; the first digit is not relevant to the calculation of dysprosium and neodym.

The remaining digits indicate the method of calculation used for the respective raw material. If no surcharge is added for a raw material, a "-" is used.

1st digit	List or customer net price using the percentage method
2nd digit	for silver (AG) [1]
3rd digit	for copper (CU) [1]
4th digit	for aluminum (AL) [1]
5th digit	for lead (PB) [1]
6th digit	for gold (AU) [1]
7th digit	for dysprosium (Dy)
8th digit	for neodym (Nd)

Weight method

The weight method uses the basic official price, the average price and the raw material weight. In order to calculate the surcharge, the basic official price must be subtracted from the average price. The difference is then multiplied by the raw material weight.

The basic official price can be found in the table below using the number (1 to 9) of the respective digit of the metal factor. Your Sales contact can inform you of the raw material weight.

Metal factor examples


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No basis necessary
No surcharge for silver
No surcharge for copper
No surcharge for aluminum
No surcharge for lead
No surcharge for gold
Dysprosium acc. to weight, basic official price 300 €
Neodym acc. to weight, basic official price 50 €

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1) For a different method of calculation, refer to the separate explanation for these raw materials on the previous page.
2) Source: Asian Metal Ltd (www.asianmetal.com)

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Appendix

Metal surcharges

Values of the metal factor

Percentage method	Basic official price in €	Step range in €	% surcharge 1st step Price in € 150.01 - 200.00	% surcharge 2nd step Price in € 200.01 - 250.00	% surcharge 3rd step Price in € 250.01 - 300.00	% surcharge 4th step Price in € 300.01 - 350.00	% surcharge per additional step
A	150	50	0.1	0.2	0.3	0.4	0.1
B	150	50	0.2	0.4	0.6	0.8	0.2
C	150	50	0.3	0.6	0.9	1.2	0.3
D	150	50	0.4	0.8	1.2	1.6	0.4
E	150	50	0.5	1.0	1.5	2.0	0.5
F	150	50	0.6	1.2	1.8	2.4	0.6
G	150	50	1.0	2.0	3.0	4.0	1.0
H	150	50	1.2	2.4	3.6	4.8	1.2
I	150	50	1.6	3.2	4.8	6.4	1.6
J	150	50	1.8	3.6	5.4	7.2	1.8
			175.01 - 225.00	225.01 - 275.00	275.01 - 325.00	325.01 - 375.00	
O	175	50	0.1	0.2	0.3	0.4	0.1
P	175	50	0.2	0.4	0.6	0.8	0.2
R	175	50	0.5	1.0	1.5	2.0	0.5
			225.01 - 275.00	275.01 - 325.00	325.01 - 375.00	375.01 - 425.00	
S	225	50	0.2	0.4	0.6	0.8	0.2
U	225	50	1.0	2.0	3.0	4.0	1.0
V	225	50	1.0	1.5	2.0	3.0	1.0
W	225	50	1.2	2.5	3.5	4.5	1.0
			150.01 - 175.00	175.01 - 200.00	200.01 - 225.00	225.01 - 250.00	
Y	150	25	0.3	0.6	0.9	1.2	0.3
			400.01 - 425.00	425.01 - 450.00	450.01 - 475.00	475.01 - 500.00	
Z	400	25	0.1	0.2	0.3	0.4	0.1
Price basis (1st digit)							
L	Calculation based on the list price						
N	Calculation based on the customer net price (discounted list price)						
Weight method	**Basic official price in €**						
1	50	Calculation based on raw material weight					
2	100						
3	150						
4	175						
5	200						
6	225						
7	300						
8	400						
9	555						
Miscellaneous							
-	No metal surcharge						

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CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG

Appendix

1. General Provisions

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

1.1 For customers with a seat or registered office in Germany

For customers with a seat or registered office in Germany, the following applies subordinate to the T&C:

- for installation work the "General Conditions for Erection Works – Germany"[1] ("Allgemeine Montagebedingungen – Deutschland" (only available in German at the moment)) and/or

- for Plant Analytics Services the "Standard Terms and Conditions for Plant Analytics Services – for Customer in Germany"[1] ("Allgemeine Geschäftsbedingungen für das Plant Analytics Services – für Kunden in Deutschland" (only available in German at the moment)) and/or

- for stand-alone software products and software products forming a part of a product or project, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany"[1] and/or

- for other supplies and/or services the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"[1].
  In case such supplies and/or services should contain Open Source Software, the conditions of which shall prevail over the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"[1]. A notice will be contained in the scope of delivery in which the applicable conditions for Open Source Software are specified. This shall apply mutatis mutandis for notices referring to other third party software components.

1.2 For customers with a seat or registered office outside Germany

For customers with a seat or registered office outside Germany, the following applies subordinate to the T&C:

- for Plant Analytics Services the "Standard Terms and Conditions for Plant Analytics Services"[1] and/or

- for services the "International Terms & Conditions for Services"[1] supplemented by "Software Licensing Conditions"[1] and/or

- for other supplies of hard- and/or software the "International Terms & Conditions for Products"[1] supplemented by "Software Licensing Conditions" [1].

1.3 For customers with master or framework agreement

To the extent our supplies and/or services offered are covered by an existing master or framework agreement, the terms and conditions of that agreement shall apply instead of T&C.

2. Prices

The prices are in € (Euro) ex point of delivery, exclusive of packaging.

The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations.

Prices are subject to change without prior notice. We will charget the prices valid at the time of delivery.

To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation.

You will find a detailed explanation of the metal factor on the page headed "Metal surcharges".

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the individual pages of this catalog – especially with regard to data, dimensions and weights given – these are subject to change without prior notice.

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[1] The text of the Terms and Conditions of Siemens AG can be downloaded at
www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

Conditions of sale and delivery

4. Export regulations

We shall not be obligated to fulfill any agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes and/or other sanctions.

Export may be subject to license. We shall indicate in the delivery details whether licenses are required under German, European and US export lists.

Our products are controlled by the U.S. Government (when labeled with "ECCN" unequal "N") and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. Government or as otherwise authorized by U.S. law and regulations.

The export indications can be viewed in advance in the description of the respective goods on the Industry Mall, our online catalog system. Only the export labels "AL" and "ECCN" indicated on order confirmations, delivery notes and invoices are authoritative.
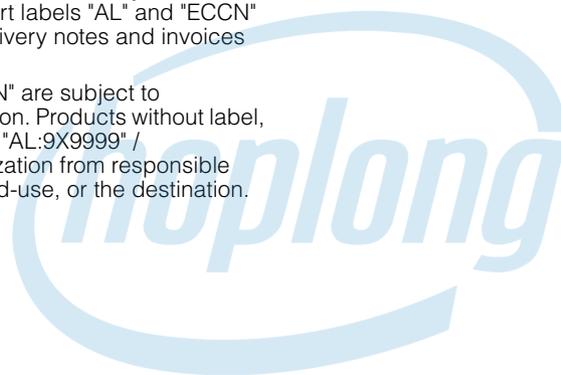
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If you transfer goods (hardware and/or software and/or technology as well as corresponding documentation, regardless of the mode of provision) delivered by us or works and services (including all kinds of technical support) performed by us to a third party worldwide, you must comply with all applicable national and international (re-)export control regulations.

If required for the purpose of conducting export control checks, you (upon request by us) shall promptly provide us with all information pertaining to the particular end customer, final disposition and intended use of goods delivered by us respectively works and services provided by us, as well as to any export control restrictions existing in this relation.

The products listed in this catalog may be subject to European/German and/or US export regulations. Any export requiring approval is therefore subject to authorization by the relevant authorities.

Errors excepted and subject to change without prior notice.

INDUSTRIAL AUTOMATION

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Siemens provides products and solutions with industrial
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In order to protect plants, systems, machines and networks
against cyber threats, it is necessary to implement – and
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Customers are responsible for preventing unauthorized
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